ONLYIAS
BY PHYSICS WALLAH

UPSC WALLAH

ECONOMY
(PART II)

COMPREHENSIVE LEARNING SERIES FOR
PRELIMS AND MAINS

ONLYIAS
BY PHYSICS WALLAH

UPSC WALLAH

ECONOMY
(PART-II)

COMPREHENSIVE LEARNING SERIES FOR
PRELIMS AND MAINS

EDITION: First

Published By: Physicswallah Private Limited

Physics Wallah Publication

ISBN: 978-93-6034-075-9

Mobile App: Physics Wallah (Available on Play Store)

Website: www.pw.live

Youtube Channel: Physics Wallah - Alakh Pandey
UPSC Wallah
UPSC Wallah - Hindi Medium
PSC Wallah - UP Bihar
MPSC Wallah

Email: publication@pw.live

Rights

All rights are reserved with the Publisher. No part of this book may be used or reproduced in any manner whatsoever without written permission from the author or publisher.

In the interest of the student community:

Circulation of soft copy of Book(s) in PDF or other equivalent format(s) through any social media channels, emails, etc. or any other channels through mobiles, laptops or desktop is a criminal offense. Anybody circulating, downloading, or storing, a soft copy of the book on his device(s) is in breach of the Copyright Act. Further photocopying of this book or any of its material is also illegal. Do not download or forward in case you come across any such soft copy material.

Disclaimer

A team of PW OnlyIAS experts and faculties with a deep understanding of the subject has worked hard for the creation and curation of this book.

While the content creators, editors and publisher have used their best efforts in preparing these books. The content has been checked for accuracy. As the book is intended for educational purposes, the author shall not be responsible for any errors contained in the book.

The publication has designed the content to provide accurate and authoritative information with regard to the subject matter covered. This book and the individual contribution contained in it are protected under Copyright Act by the publisher.

(*This Book shall only be used for educational purposes.*)

PREFACE

A highly skilled professional team of PW ONLY IAS works arduously to ensure that the students receive the best content for the UPSC exams.

A plethora of UPSC Study Material is available in the market but PW ONLY IAS professionals are continuously working to provide the supreme quality study material for our UPSC students.

From the beginning, the whole content team comprising Content Creators, Reviewers, DTP operators, Proofreaders and others are involved in shaping the material to their best knowledge and experience to produce powerful content for the students.

Faculties have adopted a new style of presenting the content in easy-to-understand language and have provided the team with their guidance and supervision throughout the creation of this book.

PW ONLY IAS strongly believes in conceptual and fun-based learning. PW ONLY IAS provides highly exam-oriented content to bring quality and clarity to the students.

This book adopts a multi-faceted approach to master and understanding the concepts by having a rich diversity of questions asked in the examination and equip the students with the knowledge for this competitive exam.

The main objective of the study material is to provide short, crisp, concise and high-quality content to our students.

BOOK FEATURES

- Holistic coverage of topics, strictly as per exam syllabus
- One-stop solution for subject wise coverage
- Intensive use of Maps, Diagrams, Flowcharts and Timelines for quick understanding and revision
- Thinking Points in and as ‘Ignite Your Mind’
- Updated with latest current affairs and data

CONTENTS

Economy (Part-II)

12. Land Reforms in India 1-23

13. Agriculture and Allied Activities-I 24-85

14. Agriculture and Allied Activities-II 86-146

15. Industries 147-187

16. Services Sector 188-200

17. Infrastructure 201-240

18. Investment Model 241-247

19. International Financial Institutions 248-266

20. SDG and Climate Change 267-274

Land Reforms in India

12

"Democracy and socialism are means to an end, not the end itself. If democracy means the freedom of the individual, if it means freedom from poverty, then land reform is the touchstone of democracy."

—Jawaharlal Nehru

INTRODUCTION

In India, the term "land reforms" refers to the actions made by the government to redistribute land from major landowners to marginal or landless farmers to combat social inequality, lessen rural poverty, and advance agricultural development. India's agrarian policy has included land reforms as a fundamental component ever since the nation attained independence in 1947.

HISTORY OF LAND REFORMS IN INDIA

Pre Independence

- During colonial times, there was a high concentration of land ownership to the Zamindars and Jagirdars and landlords who used to extract maximum rental from renters.
- A high concentration of land ownership hindered the expansion of land cultivation or output.
- After paying high rent, the tenants had nothing left with them so they made little attempt to advance their agriculture work and lacked both resources and understanding.
  - **Tenant exploitation** was pervasive and the tenancy agreements were expropriative in nature.
- The property inheritance system in India was designed in such a way that allowed division of the land because the land was disorganized.
- The fact that the land was divided up into little sections for commercial farming was one issue with agriculture.
  - Boundary lands and boundary disputes were the outcomes, which led to inefficient use of labour, capital, and soil.
- Landlords frequently moved growers among their farms according to their whims and fancy.
- A great deal of litigation resulted from the exceedingly poor condition of land records.

Post-Independence Land Reforms in India (1950-1972)

A committee headed by **J. C. Kumarappan** was designated to investigate the land issue. Comprehensive agrarian reform measures were recommended in the report of the Kumarappa Committee.

The Land Reforms of The Independent India had Four Components

In order to create the political will necessary for these reforms to be widely accepted, they were implemented in phases.

Fig. 12.1: Component of Land Reform in Independent India

THE ABOLITION OF THE ZAMINDARI SYSTEM

Eliminating the middleman layer that existed between the state and the cultivators, the zamindari system abolition was the first significant piece of legislation. This reform was comparatively the most successful than the others because it was able to diminish the zamindars' political and economic influence and remove their superior land rights in the majority of the affected areas. The reform aimed to fortify the existing landholders, namely the cultivators.

Impact

- **Reduction in rural poverty:** Land reforms empowered tenant farmers, leading to increased agricultural productivity and improved rural livelihoods.
- **Social mobility:** The abolition of the zamindari system weakened feudalistic structures, contributing to social mobility and the empowerment of marginalized communities.
- **Increased food production:** Redistribution of land and improved access to resources led to an overall increase in agricultural production, contributing to national food security.

Issues and Challenges In Zamindari Abolition

- **Absence of Land records:** The land records were not available in most places.
  - The tenancy record was oral and un-recorded, which made it difficult to secure the land rights.
- **Challenge to Constitutionality of law:** The zamindars all over the places resorted to litigation in various courts, challenging these laws.
- **Nexus with officials by zamindars:** After the enactment of the law, the Zamindars co-opted the lower-level revenue officials and parts of the judiciary to nullify the actual implementation of the act.
- **Improper classification of Lands:** In a few areas Zamindars retained their land and this land was called **"personal cultivation"** as they were loosely phrased which made mass eviction of tenants to retain their lands.
- **Elimination of only uppermost strata In the Zamindari System:** Nevertheless, sharecropping, tenancy, and landlordism persisted in many places after the Zamindari system was abolished.
  - It eliminated only the uppermost stratum of landlords inside the multi-tiered agricultural framework.
- **Large-scale evictions:** It had led to a rise of several issues, including legal, administrative, social, and economic.
  - **Problems:** Although West Bengal and J&K legalized the abolition, intermediaries were permitted to keep ownership of lands they farmed in other states without any restrictions.

Therefore, even after zamindari was formally abolished, many middlemen remained in place.

Significance of Zamindari Abolition

- Almost 2 crore tenants now own the land they farm after intermediaries were eliminated.
- A class of parasites has ended due to the elimination of intermediaries. More land has been seized by the government and given to farmers who are without land.
- The State has acquired ownership of a substantial portion of the intermediaries' private forests and arable wasteland.
- The growers and the government came into direct contact as a result of the legal abolition.

The Zamindari Abolition Act, despite its limitations, remains a landmark achievement in India's land reform efforts. It significantly altered the rural power dynamics, promoted social justice, and laid the foundation for further reforms aimed at creating a more equitable agrarian society.

TENANCY REFORMS

With the passage of the **Zamindari Abolition Acts**, tenancy control became the next big concern. In the pre-independence period, rent was paid by tenants at exorbitant rates, which ranged from 35 to 75 percent of India's gross produce. Tenancy reforms in India have been a crucial aspect of the country's socio-economic development, aiming to address issues related to land tenure, rural livelihoods, and overall economic growth.

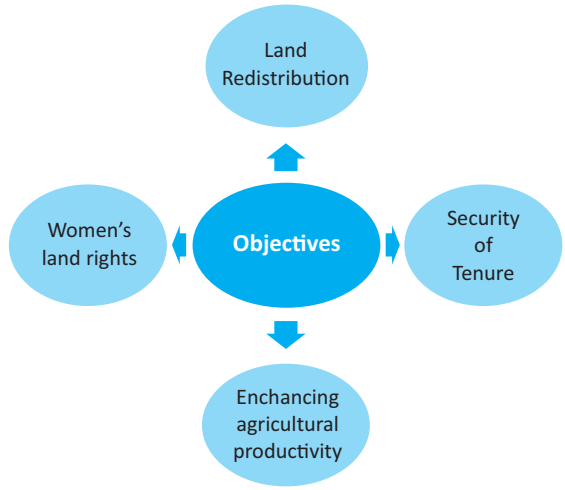


Fig. 12.2: Objectives of Tenancy Reforms

The Tenancy Reforms were

- **Provisions:** Tenancy changes were put into place to provide renters ownership, tenure security, and rent control.
  - It was either to outright forbid tenancies or regulate rents to give tenants some stability.
- **Fixing of Land Rent:** With the passing of laws in the early 1950s, fair rent was fixed at 20% to 25% of the gross produce level, except for Punjab, Haryana, Jammu & Kashmir, Tamil Nadu, and some areas of Andhra Pradesh.
  - Tenant **land rights were awarded in West Bengal and Kerala** through a comprehensive rebuilding of the agricultural system.

Successes of Tenancy Reforms

- **Reduction in Landlessness:** As per **National Sample Survey Organization (NSSO),** there is decline in the percentage of landless agricultural households in India, from 44.6% in 1971-72 to around 0.1% in 2014. Hence, there is a decrease of 16.5 percent in 40 years.
- **Increased Agricultural Investments:** Improved security of tenure has encouraged farmers to invest in their land, adopt modern farming practices, and contribute to overall agricultural productivity.
- **Empowerment of Marginalized Communities:** Tenancy reforms have played a crucial role in empowering marginalized communities by providing them with access to land resources and economic opportunities.
  - **Indian Council of Agricultural Research (ICAR)** estimated that over 70 million tenants gained ownership rights through various tenancy reform measures across India.

Weaknesses and Challenges

- **Inadequate Implementation:** Many reforms face challenges in terms of proper implementation due to bureaucratic inefficiencies, corruption, and lack of political will.
  - As per the **Ministry of Rural Development**, only around 2.4 million hectares are actually distributed to landless families.
- **Resistance from Vested Interests:** Powerful landlords often resist reforms that aim to redistribute land, creating obstacles in achieving the desired objectives of equitable land distribution.
- **Limited Awareness and Outreach:** Lack of awareness among the rural population about their rights and the benefits of tenancy reforms hinders their effective participation and engagement.
- **Patriarchal Norms and Social Barriers:** Deep-rooted patriarchal norms and societal attitudes pose challenges to the effective implementation of reforms aimed at enhancing women's land rights.

Operation Barga

It was launched in 1978, and it was a significant land reform movement in West Bengal. It aimed to empower sharecroppers (bargadars) by:

- **Recording their names:** It grants legal recognition and securing their rights.
- **Educating them about their cultivation rights:** It boosts their bargaining power and protects them from exploitation.
- **Ensuring fair share of corps:** It promotes a more equitable rural economy.

The Operation was Successful in Various Aspects Such as-

- **Increased sharecropper registration:** It significantly acknowledged their existence.
- **Improved agricultural productivity:** It leads to increased yields and overall growth.
- **Empowered rural communities:** The women fostered greater awareness about rights and their participation in rural governance.

However, Operation Barga Faced Challenges

- **Implementation issues:** There were bureaucratic hurdles, resistance from landlords, and insufficient resources.
- **Limited land redistribution:** It had not addressed land ownership and redistribution for landless farmers.
- **Incomplete reforms:** It just focused on recording sharecroppers instead of broader issues.

Despite its limitations, Operation Barga remains a landmark initiative, demonstrating the potential of government intervention to improve the lives of marginalised communities and inspiring further efforts for rural development in India.

FIXING CEILINGS ON LANDHOLDINGS

It aimed at **preventing land concentration** and promoting a more equitable distribution of resources.

In 1942, the **Kumarappan Committee** suggested the largest amount of land that a landlord might keep was three times the amount of money or enough to support a family.

All state governments had passed land ceiling acts by 1961–1962. However state-by-state variations existed in the ceiling restrictions. In 1971, a new land ceiling regulation was developed to provide consistency among the states. National standards were released in 1972, with regional variations in the ceiling limitations based on the productivity of the land and other considerations.

- The best property was between 10 and 18 acres.
- Second-class land was between 18 and 27 acres.
- The remaining land was between 27 and 54 acres, with the upper limit being in the hilly and desert regions.
- **Exemptions:** The act provided certain exemptions for categories such as
  - Educational institutions
  - Charitable trusts
  - Religious institutions.

Significance

- **Reducing Land Inequality:** Land Ceiling Acts aimed to limit the concentration of land ownership in the hands of a few, thereby reducing land inequality.
  - As per NSSO, it shows a decline in the percentage of landless agricultural households from 44.6% in 1971-72 to 0.1% in 2014. This could be partially attributed to land redistribution efforts.
- **Promoting Land Redistribution:** Ceiling Acts aimed to redistribute surplus land acquired from large landowners to landless families.
  - As per the Ministry of Agriculture report, it estimated 4.8 million hectares of land declared surplus for redistribution across India.
- **Empowering Marginal Farmers:** Land ownership through redistribution aimed to empower marginal farmers, potentially leading to increased investment and productivity.
  - **Indian Council of Agricultural Research (ICAR)** estimates over 70 million tenants gained ownership rights through reforms, potentially impacting their economic well-being.

LAND CONSOLIDATION IN INDIA

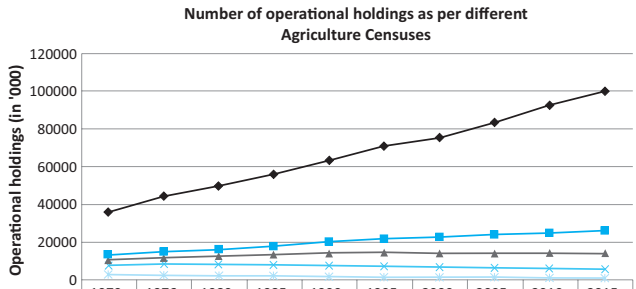
It is also known as land pooling or land readjustment is a land reform strategy which aims at reorganizing fragmented agricultural landholdings into larger, more manageable units. This process involves exchanging, merging, or reallocating scattered parcels of land belonging to different owners to create more efficient and productive farming units.

Historical Background

- The issue of land fragmentation has been a long-standing concern in India. Over generations, inheritance laws and population growth have led to the division of agricultural land into increasingly smaller and scattered parcels.
  - This fragmentation hinders agricultural productivity and efficiency due to challenges in irrigation, mechanization, and resource management.
- Recognizing the detrimental impact of fragmentation, land consolidation initiatives were first introduced in India during the British Raj in the early 20th century. However, these initiatives were limited in scope and lacked effective implementation mechanisms.
- After independence, several states in India enacted legislation to promote land consolidation. Punjab and Haryana were the first states to implement compulsory land consolidation programs with significant success. Other states adopted voluntary programs that required the consent of a majority of landowners in a particular area.

Implementation of Land Consolidation

- Laws for holdings consolidation have been passed in almost every state, with the exception of Tamil Nadu, Kerala, Manipur, Nagaland, Tripura, and some areas of Andhra Pradesh.
  - While laws in other states permitted voluntary land consolidation if the majority of landowners consented, Punjab and Haryana enforced coercive land consolidation.
- It stopped land holdings from being endlessly subdivided and fragmented.
  - It spared the farmers the time and labour of having to cultivate and irrigate different areas of their property.
    - Along with lowering cultivation costs, the change also decreased farmer litigation.
- Reconsolidation is required since the average holding size decreased from 2.28 hectares (Ha) in 1970-1971 to 1.08 Ha in 2015-16.
  - Although the average farm size in Nagaland is the greatest, Punjab and Haryana come in second and third, respectively, on the list.
  - In states with high population densities like Kerala, West Bengal, and Bihar, the holdings are considerably lower.



	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96	2000-01	2005-06	2010-11	2015-16
Marginal	36200	44523	50122	56147	63389	71179	75408	83694	92826	100251
Small	13432	14728	16072	17922	20092	21643	22695	23930	24779	25809
Semi-Medium	10681	11666	12455	13252	13923	14261	14021	14127	13896	13993
Medium	7932	8212	8068	7916	7580	7092	6577	6375	5875	5561
Large	2766	2440	2166	1918	1654	1404	1230	1096	973	838

Fig. 12.3: Number of operational holdings Year-wise

Benefits of Land Consolidation

- **Increased Agricultural Productivity:** Larger and more contiguous landholdings allow for the efficient use of irrigation systems, machinery, and other resources, leading to increased agricultural output.
- **Improved Land Management:** Consolidation facilitates better land management practices like soil conservation, crop rotation, and pest control.
- **Reduced Operational Costs:** By eliminating the need to travel between scattered parcels, farmers can save time and money on agricultural operations.
- **Enhanced Access to Credit and Markets:** Consolidated holdings improve farmers' credit-worthiness and bargaining power, enabling them to access better credit facilities and markets for their produce.
- **Improved Rural Infrastructure:** Land consolidation programs often include provisions for developing infrastructure like roads, drainage, and electricity, which benefit the entire rural community.
- **Increased Social Equity:** Land consolidation can lead to a more equitable distribution of land resources and reduce disparities among farmers.

CHALLENGES AND CONCERNS

Despite its Potential Benefits, Land Consolidation Also Faces Several Challenges in India

- **Landowner Resistance:** Some farmers are reluctant to relinquish their land, fearing loss of control or unfair compensation.
- **Lack of Awareness:** Many farmers, especially small and marginal farmers, are unaware of the benefits of land consolidation and the program's procedures.
- **Complex Legal and Administrative Procedures:** Land consolidation processes are often lengthy and bureaucratic, discouraging participation.
- **Inadequate Funding and Resources:** Limited government resources often hamper the efficient implementation of land consolidation programs.

- **Social and Cultural Factors:** Traditional land ownership patterns and inheritance customs can hinder the implementation of consolidation initiatives.

Way Forward

To improve the effectiveness of land consolidation programs in India, several recommendations can be considered:

- **Raising Awareness:** Extensive awareness campaigns should be conducted to educate farmers about the benefits of land consolidation and address their concerns.
- **Simplifying Procedures:** Streamlining legal and administrative procedures can reduce delays and make the process more efficient.
- **Ensuring Fair Compensation:** Transparent and equitable compensation mechanisms should be implemented to ensure that farmers are not unfairly disadvantaged.
- **Providing Technical Support:** Farmers should be provided with technical assistance to help them transition to larger, consolidated holdings and adopt new agricultural practices.
- **Building Trust and Community Engagement:** Building trust with landowners and actively involving communities in the planning and implementation process are crucial for success.
- **Investing in Resources:** Adequate financial and human resources must be allocated to support the efficient implementation of land consolidation programs.

IGNITE YOUR MIND

Do you think dissatisfactory results of land reforms are one of the key reasons the caste system is still prevalent in Indian society?

Land Reforms and Their Role in The Green Revolution in India

The Green Revolution, a period of dramatic agricultural growth in India, transformed the country's food security landscape. While technological advancements like high-yielding variety seeds and fertilizers played a crucial role, land reforms also significantly contributed to this transformation.

Positive Outcomes of Land Reforms

- **Increased Agricultural Production:** Land reforms helped to increase agricultural production, enabling India to achieve self-sufficiency in food grains and become a net exporter of agricultural products.
- **Improved Rural Livelihoods:** Land reforms led to increased farmer income and improved rural livelihoods. This contributed to reduced poverty and improved living standards in rural areas.
- **Social Equity:** Land reforms helped promote a more equitable distribution of land resources, reducing inequalities and empowering small and marginal farmers.
- **Sustainable Agriculture:** By encouraging consolidation and resource-efficient practices, land reforms contributed to the development of more sustainable agricultural practices.

Challenges and Limitations

- **Incomplete Implementation:** Land reforms were not implemented uniformly across all states in India, leading to disparities in benefits and hindering their overall impact.
- **Resistance from Landowners:** Large landowners often resisted land reforms, leading to delays and hindering their effectiveness.
- **Limited Focus on Small and Marginal Farmers:** Land reforms primarily benefited medium and large farmers, while small and marginal farmers continued to face challenges with land access and resources.
- **Lack of Institutional Support:** Inadequate institutional support for land reforms, including extension services and technology transfer, limited their effectiveness in promoting sustainable agricultural practices.

Land reforms were instrumental in creating the enabling environment for the Green Revolution's success in India. While challenges remain, the positive impact of these reforms on agricultural production, rural livelihoods, and social equity cannot be denied.

NON- GOVERNMENTAL MEASURE TOWARDS LAND REFORMS

"Land is not merely soil, it is a fountain of energy flowing through a circuit of soils, plants, and animals."

—Vinoba Bhave

The Bhoodan and Gramdan Movements

- Mahatma Gandhi's follower Vinoba Bhave, became aware of the issues of the **landless Harijan in Pochampalli, Telangana.** He oversaw the campaigns aimed at implementing India's land reforms program through a "non-violent revolution."
- The Bhoodan Movement got its name from the efforts made to persuade the landed classes to willingly give up a portion of their land to the landless and it started back in 1951.
- Some members of the landowner class consented to voluntarily donate a portion of their land in response to Vinoba Bhave's appeal.
  - Vinoba Bhave had received the support that he required from the Central and State administrations.

- The Gramdan movement, which got its start in 1952, eventually replaced the Bhoodan.
  - A hamlet was considered to be Gramdan under this movement if at least 75% of its citizens, who owned 51% of the land, expressed their support for Gramdan in writing.
  - The Uttar Pradesh village of Haripur was the first to fall under Gramdan.

Objectives

- Persuading landlords and leaseholders in each village to give up their land rights and turn all the land over to a village association for equitable land redistribution and cooperative farming.

Successes of The Movement

- The movement was the first to aim for social change through movement-building rather than by enacting laws after independence.
- It produced an atmosphere of moral pressure on the large landlords.
- Additionally, it increased the political engagement of landless people and peasants, creating an environment that was ideal for political propaganda aimed at organizing peasants.

Drawbacks

- Although vast tracts of land were gathered, not much was given to the landless; the majority of the donated land was either infertile or the subject of legal disputes.
- The Gramdan movement began in villages, mostly in tribal areas, where there was minimal variance in land holding ownership and no signs of class inequality.
- However, if there was a mismatch in landholdings, it did not work. In addition, the movement's revolutionary promise was not fulfilled.

Result

- There was extensive political patronage for the movements., and during the year 1969 the movements peaked.
  - Laws targeting Gramdan and Bhoodan were passed by a number of state governments.
- However, **after 1969, Gramdan and Bhoodan became less significant** because they were no longer a completely voluntary movement and instead became a government-backed initiative.
- After Vinoba Bhave left the movement in 1967, it lost its mass support.

LAND REFORMS IN INDIA (1972-85)

During the period of 1972-85, India witnessed a renewed focus on land reforms, aiming to address the issue of land inequality and promote agricultural development. This period saw several key reforms enacted to improve the barren land areas which includes the following programmes.

Drought Prone Areas Programme (DPAP)

- It was launched in 1973, this program aimed to address the specific needs of drought-prone areas, including initiatives focused on barren land management.
- It provided financial and technical assistance to farmers for activities like wasteland development, soil conservation, and rainwater harvesting, all of which aimed to improve the productivity of barren land in these regions.

Integrated Rural Development Programme (IRDP)

- It was launched in 1978, this program focused on integrated rural development, with a component dedicated to land development and watershed management.
- It provided financial support for barren land reclamation and development projects, contributing to increased agricultural land availability and productivity.

NATIONAL RURAL EMPLOYMENT PROGRAMME (NREP)

It was launched in 1980, NREP aimed to create rural employment opportunities while addressing land-related issues. It included initiatives for wasteland development, soil conservation, and afforestation, playing a role in improving the condition of barren land throughout India.

Land Reforms During This Period had a Significant Impact on Barren Land in India

- **Increased Land Availability:** Redistribution of excess land from large landowners made barren land available for cultivation by landless farmers and smallholders.
- **Enhanced Resource Utilization:** Consolidation of holdings allowed for efficient use of water, irrigation facilities, and other resources, leading to better land management and increased productivity of barren land.
- **Increased Investment:** Reforms facilitated access to credit and agricultural inputs for farmers, enabling them to invest in barren land reclamation and development.

Challenges and Limitations

Despite the positive impacts, land reforms faced several challenges in addressing the issue of barren land:

- **Incomplete Implementation:** The reforms were not implemented uniformly across all states, leading to disparities in benefits and hindering their overall impact on barren land.
- **Limited Resources:** Inadequate financial and technical resources hampered the effectiveness of barren land reclamation programs.
- **Social and Cultural Barriers:** Traditional land ownership patterns and inheritance customs sometimes hindered the implementation of reforms related to barren land distribution and management.

LAND REFORMS IN INDIA(1985-2001)

Rajiv Gandhi Era(1984-1989)

During his tenure as Prime Minister from 1984 to 1989, Rajiv Gandhi initiated several reforms related to land and agriculture, but they were not consolidated into a single land use policy. Some key initiatives include:

- **Revision of Ceiling on Landholdings, 1985:** This was aimed to reduce land concentration in the hands of a few and facilitate land redistribution to small and marginal farmers. However, its implementation was uneven across states.
- **National Wastelands Development Board (NWDB) 1985:** It was aimed to reclaim and utilize wasteland for productive purposes which also includes agriculture.
- **Panchayati Raj Act, 1989:** This devolved power and resources to local governments, including Panchayats, with the expectation that they would play a more active role in land management and development.

National Land Use Policy (1988)

India's National Land Use Policy (NLUP) was a pioneering attempt to manage land for sustainable development. Facing rapid population growth, urbanization, and environmental concerns, it aimed to:

- **Optimize land use:** Divide land for efficient purposes like agriculture, housing, and infrastructure, maximizing productivity while maintaining ecological balance.
- **Plan land use strategically:** Develop land use maps and zoning regulations at national, state, and local levels, guiding future land use decisions.
- **Conserve and preserve:** Protect natural resources like forests, wetlands, and agricultural land, preventing degradation and maintaining biodiversity.
- **Resolve land use conflicts:** Address potential clashes between different demands through dialogue, negotiation, and fair compensation.
- **Promote sustainable land management:** Encourage practices like crop diversification, soil conservation, and afforestation for improved soil health, water conservation, and preventing land degradation.

Achievements

- **Raised awareness:** NLUP brought land use issues and sustainable practices to light.
- **Land use plans:** Some states drafted plans based on NLUP guidelines, providing a framework for future decisions.
- **Conservation efforts:** The policy boosted forest conservation and protected area management.

Limitations

- **Weak implementation:** Lack of a strong framework led to uneven progress across states and limited impact on actual land use patterns.
- **Coordination gaps:** Insufficient collaboration between agencies involved in land use planning and management.
- **Funding deficit:** Inadequate funding hampered infrastructure development and capacity building initiatives.
- **Land acquisition challenge:** NLUP didn't effectively address land acquisition for non-agricultural purposes, leading to conflicts and displacement.

Moving Forward

Building on NLUP's achievements and lessons, future efforts should focus on:

- **Strengthening Implementation Mechanisms:** Clearer frameworks, increased accountability, and better resource allocation are crucial.
- **Improving Coordination:** Collaboration between stakeholders at all levels is essential for effective land use management.
- **Addressing Emerging Challenges:** Adapting to climate change, managing rapid urbanization, and ensuring equitable access to land are pressing concerns.

By building on NLUP's legacy and tackling present-day challenges, India can move closer to achieving sustainable land use, securing a healthy and prosperous future for its citizens.

IMPACT OF LPG REFORMS ON LAND REFORMS IN INDIA (1991)

The LPG reforms of 1991, encompassing Liberalisation, Privatization, and Globalization, significantly impacted various sectors in India, including agriculture and land ownership. While not directly aimed at land reforms, these broader economic changes had indirect consequences on the existing landholding structure and reform efforts.

Key Impacts

- **Increased Focus on Market-oriented Agriculture:** This shift benefited some farmers, particularly large landholders, but also raised concerns about the potential marginalization of small and marginal farmers.
- **Market-driven Land Prices:** The removal of restrictions on land ownership and transfer led to increased land prices, making it more difficult for small farmers to acquire land. This contributed to concerns about land concentration and inequality.
- **Reduced Focus on Land Redistribution:** The focus on private investment and market-driven solutions diverted attention and resources away from traditional land reform measures like ceiling on landholdings and tenancy reforms. This hampered progress on land redistribution and equity goals.
- **Increased Land lessness:** The growing emphasis on efficiency and productivity in agriculture led to some displacement of tenant farmers and agricultural laborers, contributing to an increase in landlessness.

- **Emergence of New Land Markets:** The reforms allowed for new forms of land use, such as real estate development and Special Economic Zones (SEZs). This led to increased competition for land, often at the expense of agricultural land and small farmers.

Challenges and Concerns

- **Widening Inequality:** The market-oriented approach to agriculture has contributed to a widening gap between large and small farmers, exacerbating existing inequalities in land ownership and income.
- **Loss of Livelihood:** The displacement of tenant farmers and agricultural laborers has created social and economic vulnerabilities for these communities.
- **Unsustainable Land Use:** The increased pressure on land resources can lead to unsustainable practices, such as overuse of chemicals and fertilizers, and threaten long-term agricultural productivity.
- **Erosion of Traditional Land Rights:** The reforms have raised concerns about the erosion of traditional community land rights and the potential for exploitation of vulnerable communities.

Way Forward

There is a need to re-evaluate the impact of LPG reforms on land reforms in India and consider corrective measures. This could include:

- **Strengthening Land Reform Legislation:** Reviewing and enforcing existing land reform laws to ensure equitable distribution of land and protect the rights of small farmers and tenants.
- **Promoting Sustainable Agriculture:** Supporting practices that enhance productivity while protecting the environment and ensuring long-term land use sustainability.
- **Social Safety Nets:** Implementing effective social safety nets to support vulnerable communities affected by changes in the agricultural sector.
- **Community-based Land Management:** Empowering local communities to manage their land resources sustainably and protect their traditional land rights.

LAND REFORMS IN INDIA AFTER 2001 - TILL NOW

The period between 2001 and 2024 saw a continuation of land reform efforts in India, albeit with a mixed record of success. While some progress was made, significant challenges remain in addressing land inequality and improving the lives of small and marginal farmers.

Statistics

- Land reforms have been important tools for societal change, particularly in economies where production linkages are feudal or semi-feudal.
- The average size of a land holding in India is 1.08 hectares.

As Per The 10th Agricultural Census, The Allocation of Land is Very Unequal Between States, Castes, Religions, and Gnders

- Small and marginal farmers possess 86% of India's land;
- Women own less than 13% of the country's farmland;
- The average holding size is highest in Nagaland (5 ha) and lowest in Kerala (0.18 ha).

As Per Land Use Statistics (2019-20)

LAND USE CATEGORIES

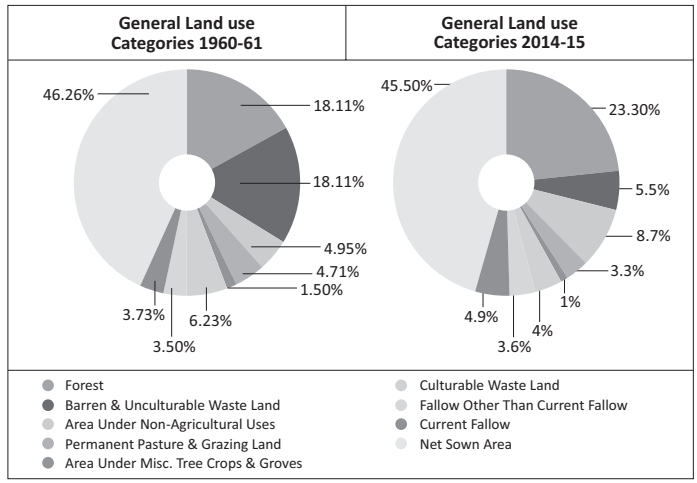


Fig. 12.4: Land Use Categories

Key Achievements

- Forest Rights Act (2006): This landmark legislation recognized the rights of forest-dwelling communities over their traditional lands.
- Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (2013): This Act aimed to ensure fair compensation and rehabilitation for farmers whose land is acquired for public purposes.
- National Land Record Modernization Programme (NLRMP): This program aimed to digitise land records and improve land governance.
- Focus on women farmers: Several initiatives were launched to empower women farmers and address gender disparities in land ownership.

Guidelines of Urban Land Policy, 2007

The Guidelines of Urban Land Policy (ULP), 2007, is a critical document issued by the Ministry of Urban Development (MoUD), Government of India. It outlines a set of principles and strategies to guide the effective management and utilization of urban land in India.

Objectives

- **Ensure equitable access to land:** The ULP aims to ensure that all sections of society, particularly the poor and marginalized, have access to affordable land for housing and other essential needs.
- **Promote efficient and sustainable land use:** The ULP encourages the efficient and sustainable use of land resources, including minimizing land degradation and promoting mixed-use development.
- **Curb speculation and stabilize land prices:** The ULP seeks to control speculation and stabilize land prices to ensure affordability and prevent inequitable distribution of land resources.
- **Promote public-private partnerships:** The ULP encourages the collaboration between the public and private sectors for infrastructure development and urban land management.
- **Strengthen urban governance:** The ULP emphasizes the need for effective urban governance, including transparency, accountability, and public participation in land-related decision-making processes.

Key Features

- **Zoning and land use planning:** The ULP emphasizes the importance of zoning regulations and land use planning to guide development and ensure orderly growth.
- **Transferable Development Rights (TDR):** The ULP promotes the use of TDRs as a mechanism to incentivize landowners to surrender land for public purposes and promote development in designated areas.
- **Land pooling:** The ULP encourages the use of land pooling schemes to facilitate planned development and ensure equitable distribution of benefits among landowners.
- **Urban renewal and regeneration:** The ULP emphasizes the need for comprehensive urban renewal and regeneration programs to revitalize decaying urban areas.
- **Social infrastructure development:** The ULP highlights the importance of providing adequate social infrastructure, including schools, hospitals, and open spaces, to meet the needs of a growing urban population.

LAND POOLING POLICY

This policy aims to provide an alternative framework for land acquisition for planned urban development. It offers a voluntary approach where landowners contribute their land to a common pool in exchange for developed plots and other benefits.

Land Pooling

Land pooling refers to a process where a group of landowners voluntarily combine their individual land parcels into a larger, consolidated block. This consolidated land is then developed for a specific purpose, typically by a government agency or private developer, with the landowners receiving a share of the developed land or its value in return.

Need of Land Pooling

It was done to address the difficulties caused by land being unavailable due to the rise in land compensation costs following the enactment of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement (Amendment) Act, 2013.

Key Features

- **Voluntary Participation:** Landowners participate in the scheme voluntarily, unlike the compulsory acquisition process under traditional land acquisition laws.
- **Planned Development:** Land pooling facilitates comprehensive planning and development of infrastructure, amenities, and social facilities within the pooled land.
- **Increased Land Availability:** By pooling small landholdings, the act creates larger parcels of land, making them more attractive for planned development.
- **Shared Benefits:** Landowners receive developed plots and other benefits proportional to their land contribution, promoting equity and shared prosperity.

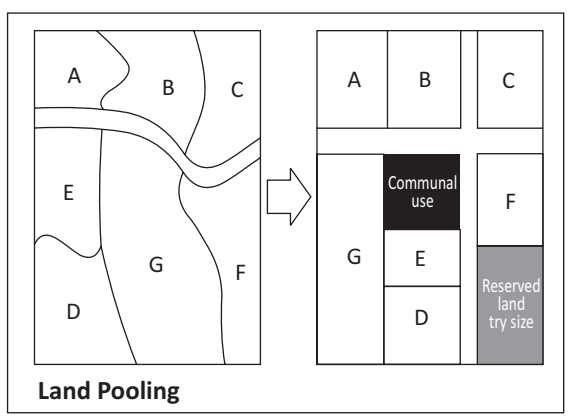


Fig. 12.5: Land Pooling

Current Data

- As of December 2023, 10 Indian states have adopted land pooling policies.
- The total area pooled across states is estimated at over 10,000 hectares.
- Implementation progress varies, with Delhi and Gujarat showcasing significant success.

LAND POOLING PROJECT IN INDIA

Case Study: Delhi Development Authority (DDA) Land Pooling Policy

- **Key Features:** Introduced in 2013, the DDA policy allows landowners to pool land for development, receiving developed plots in return.
- **Challenges:** Initial low participation due to lack of awareness, complex procedures, and concerns about compensation and development quality.
- **Measures Taken:** DDA implemented awareness campaigns, streamlined procedures, and focused on transparent communication, leading to increasing participation.
- **Outcomes:** As of October 2023, over 80% land pooling target achieved in select areas, paving the way for faster development of infrastructure and housing projects.

Challenges for Land Pooling

- **Limited Awareness and Participation:** Lack of awareness among landowners and complex procedures can hinder participation in the scheme.
- **Implementation Constraints:** Inadequate institutional capacity and delays in project execution can discourage participation and erode trust.
- **Inequitable Distribution of Benefits:** Concerns exist regarding the potential for unequal benefits for landowners depending on the location and quality of their land contribution.
- **Transparency and Accountability:** Ensuring transparency in land pooling processes and addressing potential corruption remains crucial.

Significance

Land Pooling Policy Aims to Address The Challenges of Urban Development in India by

- **Efficient Land Use:** Pooling fragmented land holdings facilitates planned development, reducing land wastage and optimizing infrastructure utilization.

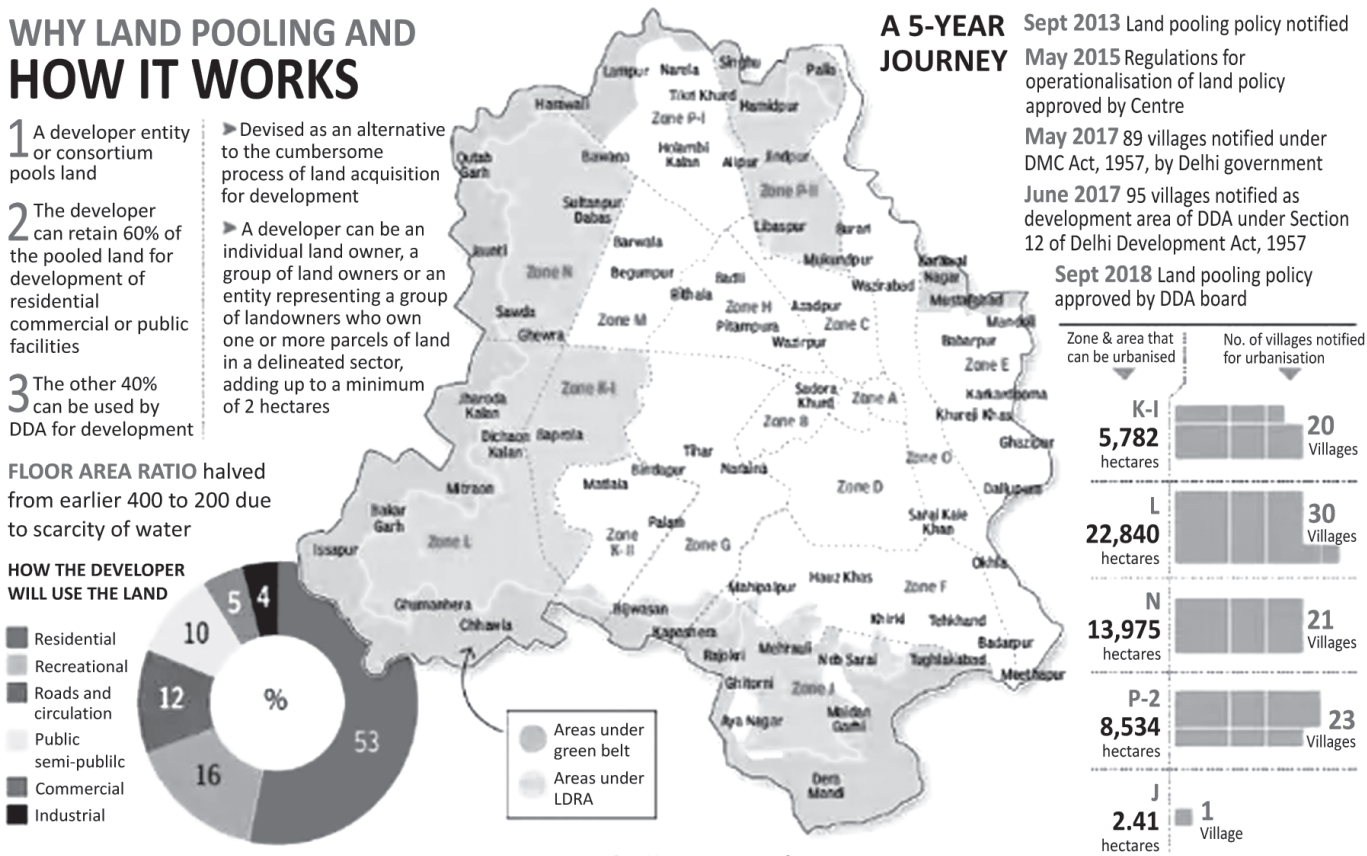

WHY LAND POOLING AND
HOW IT WORKS
1 A developer entity or consortium pools land
2 The developer can retain 60% of the pooled land for development of residential commercial or public facilities
3 The other 40% can be used by DDA for development
Devised as an alternative to the cumbersome process of land acquisition for development
A developer can be an individual land owner, a group of land owners or an entity representing a group of landowners who own one or more parcels of land in a delineated sector, adding up to a minimum of 2 hectares
FLOOR AREA RATIO halved from earlier 400 to 200 due to scarcity of water
HOW THE DEVELOPER WILL USE THE LAND
Residential
Recreational
Roads and circulation
Public semi-publilc
Commercial
Industrial
5
4
10
12
53
16
%
Areas under green belt
Areas under LDRA
A 5-YEAR JOURNEY
Sept 2013 Land pooling policy notified
May 2015 Regulations for operationalisation of land policy approved by Centre
May 2017 89 villages notified under DMC Act, 1957, by Delhi government
June 2017 95 villages notified as development area of DDA under Section 12 of Delhi Development Act, 1957
Sept 2018 Land pooling policy approved by DDA board
Zone & area that can be urbanised
No. of villages notified for urbanisation
K-I 5,782 hectares 20 Villages
L 22,840 hectares 30 Villages
N 13,975 hectares 21 Villages
P-2 8,534 hectares 23 Villages
J 2.41 hectares 1 Village

Fig. 12.6: Working Mechanism of Land Pooling

- **Faster Project Implementation:** By eliminating the need for individual land acquisition, land pooling expedites project execution, attracting investments and infrastructure development.
- **Fair Compensation:** Landowners receive developed plots in proportion to their land contribution, ensuring equitable benefit sharing and stakeholder satisfaction.
- **Sustainable Development:** Land pooling encourages mixed-use development, integrating residential, commercial, and social infrastructure, promoting sustainable urban growth.

Recommendations of Committee Reports

- **2013 High-Level Committee on Land Acquisition:** Advocated for land pooling as a voluntary alternative to land acquisition, stressing transparency and fair compensation.
- **2015 Dholatiya Committee Report:** Recommended modifications to the policy, including simplifying procedures, enhancing transparency, and addressing concerns of farmers and small landowners.
- **2018 Model Land Pooling Policy:** Provided a framework for states to implement land pooling, outlining key principles, compensation mechanisms, and institutional arrangements.

The Land Pooling Policy presents a significant opportunity to address India's urban development challenges. By implementing a comprehensive project with a focus on awareness, education, infrastructure, social safeguards, and effective monitoring, LPP can unlock the potential of land resources and contribute to building sustainable and inclusive cities for the future.

Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Amendment) Act, 2013

Key Terms

Fair Compensation:

The Act mandates that landowners receive four times the market value in rural areas and twice the market value in urban areas for acquired land, and also provides for a solatium (one-time payment) of 100% of the market value in both rural and urban areas.

This compensation amount also includes the cost of standing crops, trees, and other assets on the land.

Transparency:

The Act requires the government to disclose all details of land acquisition proposals, including the purpose of acquisition, the land to be acquired, and the compensation offered.

Public hearings must be conducted to address concerns and objections from affected people.

The Act mandates the government to obtain the consent of at least 80% of the affected families in case of private land acquisition for public-private partnerships.

Rehabilitation and Resettlement:

The Act mandates the government to provide adequate rehabilitation and resettlement packages to affected people.

These packages include land for land (where feasible), housing, livelihood options, educational facilities, and healthcare services.

The Act also provides for the establishment of resettlement and rehabilitation committees to oversee the implementation of these packages.

Features

- **Reduced Consent Requirement:** Removed the 80% consent clause for private projects, allowing them to proceed with majority consent (51%).
- **Exemptions for Certain Projects:** Exempted certain projects deemed essential for public purposes from the consent requirement.
- **Faster Land Acquisition:** Streamlined the land acquisition process to expedite project completion.
- **Limited Social Impact Assessment:** Reduced the scope of the social impact assessment for certain projects.
- **Market-based Compensation:** Introduced a market-based approach to determine land compensation, potentially lowering payouts.

Other Key Provisions

- The Act defines "affected families" broadly to include not only landowners but also tenants, sharecroppers, and agricultural laborers.
- It prohibits land acquisition for private companies unless it is for a public purpose and in the public interest.
- The Act provides for social impact assessment and environmental impact assessment before land acquisition.
- It establishes a grievance redressal mechanism for addressing complaints and grievances of affected people.

Challenges

- **Concerns about equity:** Critics argue the amendments prioritize development over the rights of landholders and displaced communities, potentially leading to unfair compensation and inadequate resettlement support.
- **Reduced transparency:** The revised provisions raise concerns about transparency and accountability in land acquisition processes.
- **Social impact concerns:** Weakening the social impact assessment may overlook potential negative impacts on communities and the environment.
- **Uncertain impact on vulnerable groups:** Reduced R&R benefits could disproportionately impact marginalized communities and exacerbate inequalities.

MODEL AGRICULTURAL LAND LEASING ACT, 2016

The Agricultural Land Leasing Act, 2016, prepared by the Government of India's think tank NITI Aayog, aims to address the issue of land access for farmers by facilitating and legalizing land leasing in India. This act aims to improve agricultural efficiency, equity, and access to land for landless and marginal farmers, promote occupational diversity, and accelerate rural growth and transformation.

Key Features

- Formalize land leasing to foster agricultural efficiency, equity, and the reduction of power imbalances. This initiative is pivotal for enhancing agricultural productivity, facilitating occupational mobility, and catalyzing rapid rural transformation.
- It allows landlords to legally lease land for agriculture and related activities with mutual consent, ensuring that leased holders cannot claim ownership under any circumstances.
- Leaseholders are empowered to access institutional loans, insurance, and disaster relief, enabling increased investment in agriculture.
- It supports the automatic resumption of land after the agreed lease period, eliminating the requirement for the tenant to leave a minimum land area even after tenancy termination, as mandated by some state laws.
- Tenants are incentivized to invest in land improvements, with provisions allowing them to reclaim the unused value of their investments upon tenancy termination.
- Additionally, a "Special Land Tribunal" within the Civil Court framework has been established to resolve disputes between landlords and leaseholders.

Challenges Associated with The Act

Despite its Potential Benefits, The Act Faces Several Challenges in Implementation

- **Uneven adoption:** States have varying levels of enthusiasm for adopting and adapting the Model Act, leading to inconsistent implementation across the country.
  - **A 2023 NITI Aayog report** on agricultural land leasing found that only 17 states had implemented the Act or a similar framework, indicating uneven adoption.
- **Limited awareness and understanding:** Both landowners and tenants often lack awareness of the Act's provisions and benefits, hindering its effective utilization.
  - Research by ICAR and other institutions has identified challenges like limited access to legal assistance and lack of awareness about fair rent determination, hindering effective lease implementation.
- **Complexities in lease agreements:** Negotiating and documenting fair and secure lease agreements can be challenging for farmers, particularly those with limited literacy or legal knowledge.
- **Dispute resolution mechanisms:** Efficient and accessible mechanisms for resolving land-related disputes arising from lease agreements are crucial, but not always readily available in rural areas.
- **Concerns about land use and ownership:** Some fear that leasing could lead to land grabbing by corporations or wealthy individuals, prompting calls for safeguards to protect agricultural land and prioritize its use for food production.
  - According to **NSSO's 2016 Situation Assessment of Agricultural Households report**, over 60% of tenant farmers in India leased less than 1 hectare of land, highlighting the dominance of small-scale lease arrangements.

Significance of The Act

- **Promoting efficient land utilization:** By making land leasing easier and more transparent, the Act encourages optimal land allocation, potentially boosting agricultural productivity.
- **Enhancing access to land for marginalized farmers:** Landless and marginal farmers, who often face difficulties acquiring land, can benefit from leasing arrangements, enabling them to participate in agriculture and improve their livelihoods.
- **Supporting diversification in agriculture:** The Act facilitates diverse lease options, potentially encouraging farmers to move beyond subsistence farming and explore more lucrative crops or agricultural practices.
- **Promoting sustainable land management:** The Act encourages lease agreements that prioritize soil health and resource conservation, contributing to long-term agricultural sustainability.

Measures to be Taken

To Address The Challenges and Maximize The Act's Potential, The Following Measures are Recommended

- **Active state-level implementation:** Encourage wider adoption of the Model Act by states, providing necessary resources and support for adaptation and implementation.
- **Awareness and capacity-building campaigns:** Organize targeted campaigns to educate farmers and landlords about the Act's provisions and benefits, empowering them to engage in informed lease agreements.
- **Simplified lease agreement templates:** Develop user-friendly templates for lease agreements, catering to diverse needs and ensuring clarity and fairness in terms.
- **Strengthening dispute resolution mechanisms:** Establish accessible and efficient mechanisms for resolving lease-related disputes, particularly at the local level.
- **Safeguards against land misuse:** Implement regulations to prevent land grabbing and ensure leased land is primarily used for agricultural purposes.
- **Continuous monitoring and evaluation:** Regularly monitor the Act's implementation across states, identifying challenges and making necessary adjustments for improved effectiveness.

The Agricultural Land Leasing Act, 2016, represents a significant step towards addressing the long-standing issue of land access for farmers in India. By facilitating a secure and legal framework for land leasing, the Act has the potential to transform the agricultural sector, improve rural livelihoods, and contribute to sustainable and inclusive rural development. However, effective implementation by different stakeholders is crucial to ensure successful realization of the Act's potential and achieving its intended goals.

BENAMI TRANSACTIONS RELATING LAND REFORMS IN INDIA

A benami transaction is a type of property transaction where the real owner (beneficial owner) uses another person (benamidar) as a front to hold the property title. This can be done for various reasons, including:

- Tax evasion
- Avoiding land ceiling laws
- Hiding wealth
- Keeping assets out of reach of creditors.

Fig. 12.7: Working under Benami Transaction Act

Prohibition of Benami Transactions Act, 1988

The Benami Transactions (Prohibition) Act, 1988, plays a crucial role in India's land reform efforts. This Act was enacted to curb the practice of benami transactions, which were often used for illegal purposes such as tax evasion, money laundering, and concealing real ownership. The Act prohibits all benami transactions and provides for penalties for offenders.

Key Provisions of The Act

- Defines a benami transaction and lays out conditions that qualify as such.
- Prohibits entering into any benami transactions.
- Declares benami transactions void.
- Empowers authorities to confiscate benami property.
- Provides for penalties, including imprisonment and fines, for offenders.

Fig. 12.8: Provisions under Benami Transaction Act

Significance of Benami Act to Land Reforms

- **Curbing tax evasion:** By exposing and penalizing benami transactions, the government can collect taxes that would otherwise be lost.
- **Enforcing land ceiling laws:** The Benami Act allows authorities to identify and confiscate benami land holdings exceeding the permissible limits under land ceiling laws. This ensures fairer distribution of land resources.
- **Improving land record accuracy:** By preventing benami transactions, the act helps maintain accurate land records, which is crucial for effective land management and administration.
- **Discouraging speculation and hoarding:** The Benami Act acts as a deterrent, promoting a more equitable land market.
- **Promoting transparency and accountability:** By exposing benami transactions, the act sheds light on hidden wealth and promotes transparency in land ownership. This holds individuals and entities accountable for their land holdings.

Role of Benami Transactions in Posing Threats to Land Reforms in India

- **Concentration of land ownership in the hands of a few:** Benami transactions can be used to bypass land ceiling laws, allowing individuals to acquire more land than permitted.
- **Dispossession of small farmers:** Benami transactions can be used to take land away from small farmers, leading to landlessness and poverty.
- **Inefficient land use:** Benami lands are often unproductive and underutilised, hindering agricultural production.
- **Corruption:** Benami transactions are often associated with corruption and black money, undermining good governance.

Challenges and Limitations

Despite its Positive Impact, The Benami Act Faces Certain Challenges

- **Difficulty in proving benami transactions:** The burden of proof lies with the authorities, who often lack the resources and expertise to investigate complex benami arrangements.
- **Loopholes and legal ambiguities:** The act contains certain ambiguities and loopholes that can be exploited by offenders to evade its provisions.
- **Lack of awareness:** Many potential beneficiaries, especially in rural areas, are unaware of the Benami Act and its implications on their land rights.

Amendments and Improvements

Several amendments have been made to the Benami Act over the years to address its shortcomings and strengthen its effectiveness. These include:

- **The Benami Transactions (Prohibition) Amendment Act, 2016:** This act introduced stricter penalties for benami transactions, including imprisonment and confiscation of benami property.
- **The Benami Transactions (Prohibition) Amendment Act, 2017:** This act established the Benami Prohibition Unit (BPU) to specifically investigate benami transactions and prosecute offenders

Penalty: offences are non-congnisable and non-bailable

Offence	Fine	Imprisonment
For guilty of offence of a benami transaction	Upto 25% of the Fair Market Value	Minimum 1 year upto 7 years
For providing false information	Upto 10% of the Fair Market Value	Minimum 6 months upto 5 years

The Benami Transactions (Prohibition) Act, despite its challenges, plays a significant role in land reform efforts in India. By curbing tax evasion, enforcing land ceiling laws, improving land record accuracy, and promoting transparency, the act contributes to a fairer and more efficient land management system. However, continued efforts are needed to address the act's limitations, raise awareness, and ensure its effective implementation.

RERA AND LAND REFORMS IN INDIA

The **Real Estate (Regulation and Development) Act, 2016 (RERA)** and land reforms in India are two distinct yet interconnected policies aiming to regulate and improve the real estate sector and land ownership patterns. Understanding their relationship is crucial for appreciating their impact on India's economic and social development.

RERA

- **Purpose:** To regulate and promote the real estate sector, protect home buyers' interests, and ensure transparency and accountability in transactions.
- **Key Provisions:**
  - Registration of developers and real estate projects.
  - Mandatory disclosure of project details.
  - Formation of Real Estate Regulatory Authorities (RERAs) in each state/UT.
  - Establishment of a grievance redressal mechanism.

Relationship Between RERA and Land Reforms

- **Land Acquisition:** RERA regulations can influence land acquisition processes for real estate projects, ensuring fair compensation to landowners and minimizing displacement.
- **Transparency in Land Transactions:** RERA promotes transparency in land transactions, potentially hindering illegal land deals and manipulations often associated with land reforms implementation.
- **Infrastructure Development:** RERA-compliant real estate projects can contribute to improved infrastructure development in rural areas, indirectly benefiting land reforms by facilitating access to markets and services.
- **Investment in Agriculture:** RERA can attract investment in rural areas through regulated real estate projects, potentially supporting agricultural development and creating job opportunities.

Challenges

- **Effective Implementation:** Both RERA and land reforms require strong enforcement mechanisms and resources to address bureaucratic hurdles and corrupt practices.
- **Land Availability:** Land scarcity, particularly in urban areas, can hinder both RERA-compliant development and effective land redistribution under reforms.
- **Awareness and Access:** Lack of awareness and accessibility to information about RERA and land reforms can limit their impact and benefit only a fraction of the intended population.

Significance

- **Empowered Homebuyers:** Provides legal recourse and information to hold developers accountable and make informed decisions.
- **Enhanced Transparency:** Promotes a more transparent market with clear information about projects and developers.
- **Reduced Risk of Fraud and Delays:** Discourages fraudulent practices and ensures timely project completion.
- **Attracting Investments:** Builds trust among investors and facilitates greater financial resources for real estate development.
- **Promotes Market Stability:** Reduces speculation and market manipulation practices.

LAND RECORDS IN INDIA - MODERNISATION & DIGITIZATION

Land Records consist of various types of information (property maps, sale deeds) and are maintained across different departments at the district or village level.

Issues Associated with Land Records:

- **Outdated acts of the British era for registration:** Under the **Registration Act,1908,** acquisition of land by the government, court decrees, land orders, ship partitions, and leased land for less than a year registration is not mandatory.
- **Lack of accessibility due to manual registration:** Manual registration and documents with the revenue department are not easily accessible to the public leading to litigation.
  - Piles of papers stacked one above the other in a dark room led to deterioration of records.
- **Role of Multiple agencies:** Multiple agencies are responsible for land records and it is difficult to ensure the data matches across all agencies.
  - Lack of single window title verification and investigation system.

NEED OF LAND RECORDS MODERNISATION

- Land Records consist of various types of information (property maps, sale deeds) and are maintained across different departments at the district or village level.
- Almost 66% court cases in the country are related to land disputes costing a whopping ₹ 58,000 crore in litigation, both civil and criminal.
- NITI Aayog has said that such property cases take an average of 20 years to settle.
- It helps to reduce litigation and scope of property disputes and helpful to move towards conclusive property titles.
- Agriculture Credit can be provided to farmers, as a clearly titled land can be used as collateral.
- It gives a fillip to manufacturing as lack of clear land records delay or stall land acquisition.
- As it is transparent and tamper-proof land records which helps to check Benami transactions and associated parallel economy.
- Free accessibility to the records will reduce interface between the citizen and the Government functionaries, thereby reducing rent seeking and harassment.

National Land Record Modernization Programme (NLRMP), 2008

This initiative was started in 2008 which was aimed to modernize land records and make them more transparent and accessible. It addressed the critical issue of outdated and inefficient land management systems in the country.

Objectives of NLRMP

- **Modernize land records:** Replacing paper-based records with digital records in the form of maps and textual data.
- **Computerized land registration:** Streamlining the process of registering land transactions and making it more efficient and transparent.
- **Improve land information management:** Developing a centralized database for land records and making them accessible to citizens and authorized stakeholders.
- **Strengthen land administration:** Enhancing the capacity of land record offices and personnel to manage land records effectively.

DIGITIZATION OF LAND RECORDS

In order to upgrade the land records system in the nation and establish a definitive land-titling system with title guarantee, the Government of India initiated the National Land Record Modernization Programme (NLRMP), a centrally supported initiative, in 2008. Thereafter, in 2016 the NLRMP underwent a redesign and was called the Digital India Land Records Modernization Programme (DILRMP).

It is a Central Sector scheme that has been extended to 2023-24, to complete its original targets as well as expand its ambit with a slew of new schemes.

Implementation: It is being implemented by the Department of Land Resources (Ministry of Rural Development).

SOME FEATURES OF DIGITIZATION OF LAND RECORDS

- Computerization of existing land records and transfers and registration process.
- Digitization of maps and integrating all data types like spatial and textual records.
- Survey and resurvey and update settlement records.
- Development of core GIS and capacity building.
- DLRMP intends to move towards conclusive and state-guaranteed titles from presumptive titles.

Initiatives For Digitalisation

- **National Generic Document Registration System**
  - The current manual registration system of land transactions is being replaced by an online system for all land transfers and sales, which is a significant change.
  - It represents a significant advancement toward **"One Nation One Software"** and national integration.
- **Unique Land Parcel Identification Number**
  - Referred to as **"the Aadhaar for land,"** this number would serve as a unique means of identifying each surveyed parcel of land and thwart property fraud, particularly in rural India's hinterlands where land records are often disputed and out-of-date.

Before Government of Land Records

National Council of Applied Economic Research (NCAER) (1956)	It is an annual land records index prepared by Delhi-based think- tank National Council of Applied Economic Research (NCAER). Madhya Pradesh, West Bengal and Odisha are the simplest performing Indian states in land record digitisation,
Bhoomi Project (2000)	Karnataka was the primary state in India to computerize land records under the "Bhoomi Project".
Digital India Land Records Modernization programme (DILRMP) (2008)	The target of the programme was to streamline and reduce the scope of land and property disputes, thereby improving transparency within the maintenance of land records.
SVAMITVA Scheme: Survey of Villages and Mapping with Improvised Technology in Village Areas (2021)	It is a scheme for mapping the land parcels in rural inhabited areas using drone technology and Continuously Operating Reference Station (CORS). This Scheme comes under the Ministry of Panchayati Raj.

Achievements of Digitisation of Land Records

Significant Progress in Computerization of Land Records Across The Country

- The Government has achieved 94% digitization targets pan-India, as per the Digital India Land Records Modernization Programme.
- As per Ministry of Rural Development, 2022, it reduced land disputes and suggested a decrease in land disputes due to clearer and accessible land records,

Challenges in Digitalisation

- **Need of multiple documents across departments:** In India, land ownership is established through multiple documents maintained by different departments, making it cumbersome to access them, thus affecting digitization.
- **Poor progress in computerization of land records:** While some states like Karnataka and Odisha have completed 100% computerization of land records, many others are still lagging in the implementation.
- **Land conflicts affect digitization:** Hundreds of laws and the lack of clear titles make up about two-thirds of all civil cases in Indian courts, further affecting the modernization of land reforms.
- **Issues in land ownership and identification of landowners:** In India, there exists a system of registered sale deeds and not land titles, which implies that the transaction gets registered, and not the land title.
- **System of registered sale deeds:** Allow only the registration of transaction not the title as per the Transfer of property Act 1882 and Registration Act 1908.
  - **Registration Act, 1908:** Do not provide for mandatory registration such as transaction of acquisition of land by government and land on lease for less than a year.
- **Data discrepancies:** Since the land documentation data is maintained by different government departments, they are not updated often.
- **High cost of Property Registration:** People avoid registration to avoid payment for stamp duty.
- **Cyber security:** Vulnerability to cyber threats, issue of internet connection and networks.

Way Forward

- Continued efforts are required to address data quality issues and ensure interoperability of land record systems.
- Increased focus on capacity building and training for land record officials.
- Expansion of online services and awareness programs to ensure wider citizen participation.
- Integration of land records with other government databases for better planning and development.

DILRMP is a transformative initiative that has significantly improved land record management in India. By addressing the remaining challenges and focusing on continuous improvement, DILRMP can further enhance transparency, efficiency, and accessibility in land administration, contributing significantly to India's economic and social development.

SVAMITVA SCHEME

Aim

This scheme is a reformative step towards establishment of clear ownership of property in rural inhabited ("Abadi") areas, by mapping of land parcels using drone technology and providing 'Record of Rights' to village household owners with issuance of legal ownership cards (Property cards/Title deeds) to the property owners.

- **Implemented by:** The Scheme is implemented with the collaborative efforts of the Ministry of Panchayati Raj, State Revenue Department, State Panchayati Raj Department and Survey of India.

- **Coverage:** There are about 6.62 lakh villages in the country which will be eventually covered in this scheme. The entire work is likely to be spread over a period of five years.

Objectives

The Scheme Seeks to Achieve The Following Objectives

- Creation of accurate land records for rural planning and reduce property related disputes.
- To bring financial stability to the citizens in rural India by enabling them to use their property as a financial asset for taking loans and other financial benefits.
- Determination of property tax, which would accrue to the GPs directly in States where it is devolved or else, add to the State exchequer.
- Creation of survey infrastructure and GIS maps that can be leveraged by any department for their use.
- To support the preparation of a better-quality Gram Panchayat Development Plan (GPDP) by making use of GIS maps.

Key Features

- **Drone-based mapping:** The scheme utilizes drone technology to map rural abadi areas, providing accurate and detailed data for property identification and record keeping.
- **Community participation:** Local residents are actively involved in the mapping process, ensuring transparency and accuracy of data.
- **Digital land records:** Property information is digitized and stored electronically, enhancing transparency and accessibility.
- **Issuance of property cards:** Residents receive legal ownership documents (property cards) recognized by the government.

Various Stages in SVAMITVA Scheme & its Glimpses

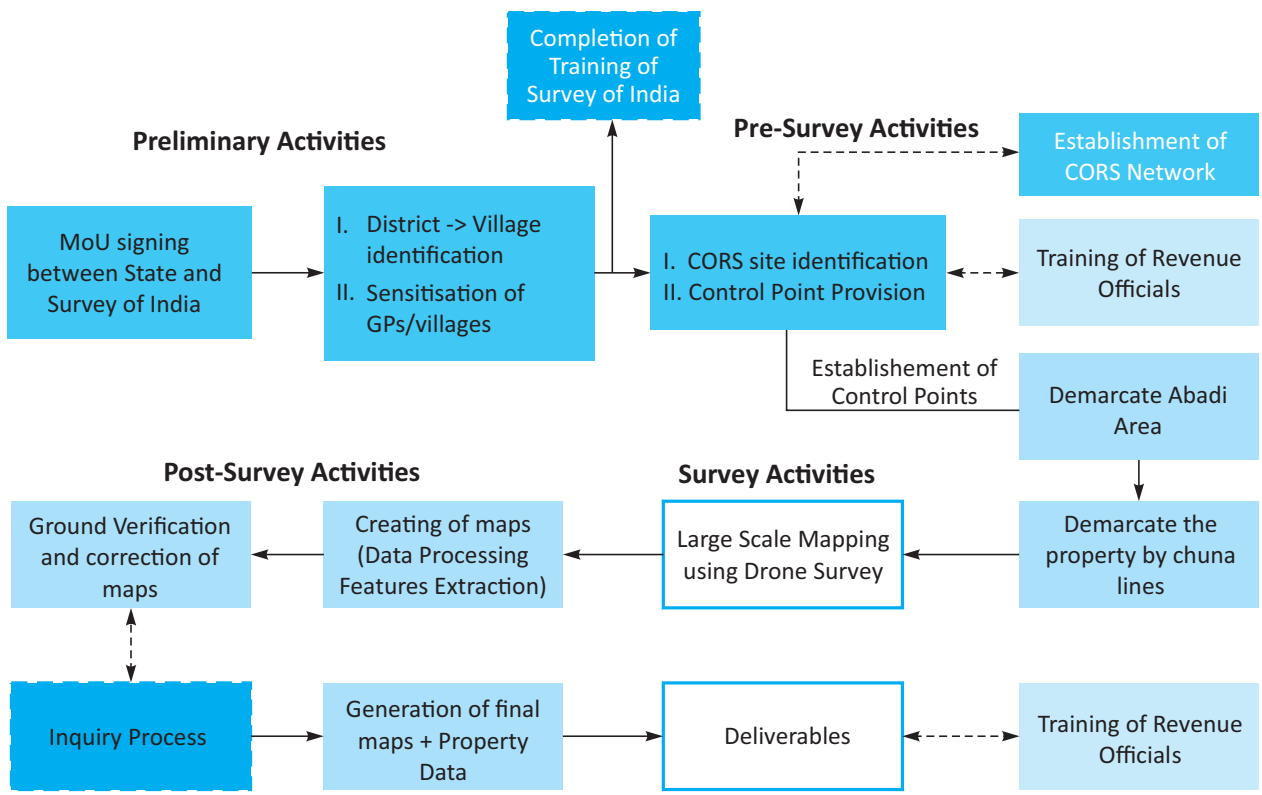

Completion of Training of Survey of India
Preliminary Activities
Pre-Survey Activities
Establishment of CORS Network
MoU signing between State and Survey of India
I. District -> Village identification
II. Sensitisation of GPs/villages
I. CORS site identification
II. Control Point Provision
Training of Revenue Officials
Establishement of Control Points
Demarcate Abadi Area
Post-Survey Activities
Survey Activities
Ground Verification and correction of maps
Creating of maps (Data Processing Features Extraction)
Large Scale Mapping using Drone Survey
Demarcate the property by chuna lines
Inquiry Process
Generation of final maps + Property Data
Deliverables
Training of Revenue Officials

Fig. 12.9: Various Stages in SWAMITVA Scheme

Digital Digitization and Property Cards Targets

- **Total number of property parcels digitally mapped:** Over 8.48 crore
- **Total number of property cards distributed:** Over 63,560
- **Target for property card distribution by March 2024:** 1 crore (10 million)

The Svamitva Scheme represents a significant step towards improving land governance and empowering rural communities in India. By addressing the existing challenges and continuously improving its implementation, the scheme has the potential to contribute significantly to rural development and economic growth.

ULPIN SYSTEM

The Unique Land Parcel Identification Number (ULPIN) System is a national initiative in India aimed at digitizing and standardizing land records across the country. It is

also known as **Bhu-Aadhaar,** signifying its role as a unique identifier for land parcels, similar to the Aadhaar number for individuals.

Objectives

- **Standardization:** To create a uniform and interoperable system for land records across all states and union territories, eliminating variations in existing land identification systems.
- **Transparency:** To provide a single source of truth for land ownership information, accessible to all stakeholders, including citizens, government agencies, and financial institutions.
- **Efficiency:** To streamline land transactions and dispute resolution through accurate and readily available land records.
- **Economic Growth:** To facilitate easier access to land-based credit and investment opportunities, boosting the economy and rural development.

Key Features

- **Unique 14-digit identifier for each land parcel:** This identifier is based on the geo-coordinates of the parcel, ensuring its uniqueness and permanence.
- **Integrated Land Information Management System (ILIMS):** A centralized platform for storing and managing land records, including ownership details, spatial data, and historical transactions.
- **Open standards and interoperability:** The system is designed to be compatible with existing land record systems and other government databases, facilitating seamless data exchange.
- **Security and privacy:** The system implements robust security measures to protect sensitive land information and ensure user privacy.

Benefits

- **Reduced land disputes:** Improved accuracy and accessibility of land records will lead to fewer disputes and conflicts over ownership.
- **Increased transparency:** Citizens and stakeholders will have a clear view of land ownership and transaction history, fostering trust and accountability.
- **Ease of doing business:** Streamlined land transactions will facilitate investment and economic activity in the land sector.
- **Financial inclusion:** Easier access to land records will improve the creditworthiness of farmers and rural communities, enabling them to access loans and investment opportunities.
- **Improved land management:** The system will support efficient land use planning and resource management by providing comprehensive land data.

Current Status

- The ULPIN system is currently in its initial stages of rollout, with pilot projects being implemented in several states.
- The full nationwide implementation is expected by March 2024.

Challenges and Future Prospects

- The success of the ULPIN system hinges on addressing challenges such as data integration, standardization across states, and ensuring user acceptance and adoption.
- The system holds significant potential for transforming the land sector in India, enabling greater efficiency, transparency, and economic growth.

NATIONAL LAND MONETIZATION CORPORATION (NLMC)

The Special Purpose Vehicle (SPV) was introduced by the Union Finance Minister in the Union Budget 2021–2022 to facilitate the monetisation of government and surplus land holdings of public sector enterprises (PSU).

Monetisation

When the government monetarizes its assets, it is effectively giving a private player the asset's revenue rights for a predetermined amount of time. In exchange for these benefits, the government receives an initial payment from the private party, a consistent portion of the asset's income, a guarantee of ongoing investment in the asset, and title rights to the asset that has been made profitable

About NLMC

- The Government of India will own the entire company known as the NLMC and the Ministry of Finance will have administrative control over it.
- It would be established with a paid-up capital of 150 crore and an initial authorized share capital of 5,000 crore.

Functions of NLMC

- **Asset Monetization:** NLMC will monetize surplus, underutilized, or unutilized land assets belonging to the public sector and to the government.
- **Strategic Disinvestment:** In order to unlock the value of these land holdings, the Corporation will also make it easier to sell off the assets of PSUs that have shut down or are slated for a Strategic disinvestment.
- **Advisory Body:** The NLMC will serve as an advisory body to assist other governmental organizations and CPSEs in locating their surplus non-core assets and monetising them effectively and professionally to maximize the potential for wealth realization.

- **Directory of Best Practises:** As an agency role, the NLMC will handle land monetisation and is anticipated to serve as a directory of best practices.

Ways of Monetisation

There are Following Ways For Monetising Government Assets

- When it comes to the monetisation of land for specific purposes, such as offices, a Real Estate Investment Trust (REIT) is a firm that manages and holds land assets and occasionally provides funding for real estate that generates income.
- Government assets can potentially be made profitable by using the Public Private Partnership (PPP) model.

Need of Monetisation

- In order to generate new revenue streams, the government markets its assets.
- Through the participation of institutional investors or private actors, monetization is also done to unlock the potential of underutilized or unneeded assets.
- It's also done to produce capital or resources for the development of future assets; for example, using the proceeds from monetisation to fund the development of new infrastructure projects.

Current Land Available For Monetisation

- As per the Economic Survey 2021-2022, it states that CPSEs have currently offered around 3,400 acres of land for possible monetisation.
- **The survey indicates that PSUs' non-core asset monetisation is in a variety of stages:**
  - For example, BSNL had identified properties worth ₹ 24,980 crore for monetisation as of March 2020.
  - In contrast, the Ministries of Defense and Railways own the majority of the nation's public land.
  - 1.25 lakh acres of the land is vacant from 11 lakh acres of land that the Railways have.
  - 17.95 lakh acres of land are under the control of the Defence Ministry. Of this, around 16 lakh acres are outside the borders of the 62 military cantonments and about 1.6 lakh acres are inside them.

Challenges in Monetisation of Land

- Absence of recognizable revenue sources across different assets.
- Government firms' privatization is moving slowly.
- It is evident from the less than stellar bids received for the recently announced Public-Private Partnerships (PPP) project in trains that getting the attention of private investors is not an easy task.
- Low utilization of capacity in pipeline networks for petroleum and gas.
- Controlled prices on assets in the power sector.
- Investors have little interest in national highways with fewer than four lanes.

Way Forward

- The fulfillment of their respective roles by other stakeholders is necessary for the infrastructure expansion plan to succeed.
  - These consist of the public sector, state governments, and their public sector enterprises.
- In this regard, the Fifteenth Finance Commission has suggested that a High-Powered Intergovernmental group be established in order to revisit the federal and state laws pertaining to fiscal responsibility.
- Sustaining transparency is essential for achieving sufficient asset value realization.
- According to recent experience, public-private partnerships, or PPPs, now entail open bidding, transparent auctions, and a full knowledge of the rewards and dangers.
  - Thus, it is impossible to overlook the value of PPP in greenfield projects.

The National Land Monetisation Corporation plays a crucial role in unlocking the potential of India's land resources for infrastructure development and economic growth. By effectively addressing the challenges and leveraging the opportunities, NLMC can contribute significantly to India's journey towards a sustainable and prosperous future.

MIGRATION OF PEOPLE DUE TO LAND REFORMS IN INDIA

Land reforms in India have been a continuous process since independence, aiming to address issues of land inequality and promote rural development. These reforms have often resulted in the redistribution of land and changes in tenancy arrangements, leading to significant impacts on rural populations. One of the key consequences has been the migration of people within India, seeking new opportunities and livelihoods.

Causes of Migration

Several Factors Contribute to Migration Triggered by Land Reforms

- **Landlessness:** Land reforms can lead to the eviction of tenants or sharecroppers, leaving them landless and without a livelihood. This often forces them to migrate to urban areas in search of work.
- **Ceiling on landholdings:** Land ceiling laws limit the amount of land an individual can own. This can lead to the fragmentation of landholdings and make it difficult for farmers to earn a sustainable income. This can drive them to migrate to cities for better economic opportunities.

- **Changes in tenancy arrangements:** Reforms altering tenancy arrangements, like the abolition of intermediaries, can disrupt traditional landholding patterns and force some individuals to migrate in search of new land or employment.
- **Uncertain land rights:** Lack of clarity in land ownership due to incomplete reforms or bureaucratic hurdles can lead to insecurity and push individuals to seek alternative sources of income outside their villages.
- **Declining agricultural productivity:** In some cases, land reforms may lead to a decline in agricultural productivity due to factors like smaller landholdings or lack of access to resources. This can prompt migration as people search for better livelihoods.

Migration due to land reforms is a complex phenomenon with far-reaching consequences. By addressing the root causes of land-related migration, promoting sustainable rural development, and ensuring the well-being of migrants in urban areas, India can harness the potential of migration for positive social and economic transformation.

SUCCESS OF LAND REFORMS IN INDIA

- Abolished exploitative land tenure systems which were prevalent in agrarian society.
- It distributed the surplus land among the landless and the weaker sections of the society.
- It provided security of tenure to the tenants through Land Tenancy laws.
  - In some cases, tenants are even given ownership rights. Fixed rent in the range of 25-33%.
- The cumulative effect of the abolition of Zamindari, tenancy legislation, and ceiling legislation motivated the cultivators to invest and improve agricultural practices.
  - It made a significant positive impact on poverty removal.
- Lower castes have become more organized and assertive about their rights.
  - It brought fundamental changes in the agrarian economy, rural social structure, and rural power structure.
- Moved Indian society towards an egalitarian society.
- It increased democratization of Indian polity and reduction in the influence of the dominant sections of the society.

FACTORS RESPONSIBLE FOR THE SUCCESS

- Political mobilization during freedom struggle based on agrarian issues. This political awareness and education facilitated the acceptance of land reforms for the development of agriculture.
- Political will of the then government to insert the 9th schedule in the constitution and abolish the right to property. There was widespread acceptance in the political spectrum.
- Kisan Sabhas and Farmers Associations also helped farmers to organize themselves and raise their demands.
- Judicial backing and progressive interpretations of constitutional provisions aided in land reforms.
  - **Example:** land reform legislations through IX schedule.
- Tenancy reforms were most successful in Kerala and West Bengal.
  - **Operation Barga:** In West Bengal Operation Barga was launched in 1978 with the objective of achieving the registration of sharecroppers and providing them permanent occupancy and heritable rights and a crop division of 1:3 between landowner and sharecropper.

HURDLES IN LAND REFORMS IN INDIA

The efforts towards land reform are tardy and slow in India. Following reasons can be attributed for poor progress of land reforms.

- **Lack of Political Will:** The enactment and effective implementation of progressive reforms are beset by a lack of political will. Strong political decisions, as well as effective political support, guidance, and control, are necessary for such drastic steps.
  - However, the democratic political power structure of the nation prevents political will from emerging.
- **Absence of Reliable Records:** The main obstacle preventing land reforms from moving forward more quickly is the lack of accurate and updated land records.
  - There hasn't been a methodical program evaluation, and the reporting system is unreliable and inadequate. As a result, it is impossible to identify what is preventing land reform from being implemented.
- **Legal Challenges:** Implementing land reforms in the nation is hampered by legal issues as well. Protracted litigation and legal loopholes impede the progress of land reforms. There are numerous flaws in the laws pertaining to land reforms.
- **Inadequate Financial Support:** An additional barrier to land reforms is a lack of financial support. Insufficient funding has been set aside for land reform initiatives. The inadequate outcomes of land reform initiatives can be mostly attributed to this.
- **Absence of Integrated Approach:** Programs for land reform have been seen as distinct from the nation's overall economic development. The elimination of intermediate tenures, tenancy changes, holdings caps, and other initiatives lack a cohesive strategy and adequate coordination.

- **Improper Implementation:** The revenue administrations of the individual states are responsible for carrying out land reform.
  - Land reforms receive the least attention because maintaining public order, collecting land revenue, and other regulatory duties are given top importance.
- **Indifferent Attitude of the Administration:** The state revenue department bears complete accountability for carrying out land reforms.
  - The attitude of the administrative staff is quite indifferent and their behavior is cold . In addition, landlords have a significant influence over the village officials.
- **Lack of awareness and pressure from Below:** "Except in few scattered and localized pockets, practically all over the country the poor peasants and agricultural workers are passive, unorganized and non-cooperative," according to a Task Force of the Planning Commission.
  - Land reform recipients do not belong to a distinct social or economic group. Consequently, there hasn't been any internal pressure for its successful execution.

Way Forward

- **The Digital India Land Records Modernization Programme (DILRMP):** The target of the programme was to streamline and reduce the scope of land and property disputes, thereby improving transparency within the maintenance of land records.
- **Administrative Changes:** Administrative changes at the state level that streamline the collection and maintenance of land data, for example - Karnataka's BHOOMI Project.
- **Ten Point Agenda of the Government of India:** It is a strong beginning in addressing some of these seemingly intractable problems. These are:
  - The agreement of the State governments on the National Land Reform Policy.
  - National Legislation for guaranteeing shelter land to the millions of homeless and landless, particularly in rural areas.
  - Stronger Implementation of the Central Acts related to Forest Lands.
  - Engendering Land Ownership to ensure strengthening of women's equality.
  - Ensuring the functioning of Land Tribunals.
  - Oversight by bodies jointly governed by Government and Civil Society.
- **Draft National Land Reforms Policy:** The draft has five goals:
  - Restore land unjustly taken from vulnerable communities such as Dalits (untouchables) and Tribals.
  - Protect the land of the Dalits and Tribals including the commons that they depend on going forward
  - Liberalize leasing laws.
  - Improve land rights of women.
  - Appropriate amendment to Forests Right Acts, 2006.
- Model Agriculture Land Leasing Act, 2016, should be implemented by states as land is a State subject.
- Implementing the recommendations of Model Land Lease Act (2016) prepared by NITI Aayog-appointed expert body headed by T Haque.

SUPREME COURT JUDGEMENTS ON LAND REFORMS IN INDIA

The Supreme Court of India has played a crucial role in shaping the landscape of land reforms in India through various landmark judgments. These judgments have interpreted and enforced land reform legislation, addressed key issues related to land ownership and distribution, and protected the rights of vulnerable groups like farmers and tenants. Here's a summary of some significant Supreme Court judgments on land reforms:

State of Kerala v. Thomas (1976)	This case dealt with the interpretation of the Kerala Land Reforms Act and established the principle of **"fair rent"** for tenants, ensuring their protection against exploitation by landlords.
Sheokumar v. State of Karnataka (2011)	This case upheld the validity of land acquisition laws but laid down stringent guidelines for ensuring fair compensation and rehabilitation of displaced persons. The court emphasised the need for transparency and public participation in the land acquisition process.
State of Rajasthan v. Mohan Lal (2022)	This case dealt with the issue of benami transactions, where land is held in the name of one person while the real owner is another. The court emphasised the need for stricter enforcement of laws against benami transactions to prevent misuse of land resources and ensure transparency in land ownership

LAND REFORMS COMMITTEE IN INDIA

Land reform has been a central issue in India's post-independence development, aisming to address inequalities in land ownership and promote agrarian development. Several committees have been appointed by the government throughout history to examine land issues and recommend reform measures. Here's a summary of their key contributions:

Land Reform Committee in India

Kumarappa Committee (1949)	This committee, chaired by J.C. Kumarappa, recommended comprehensive land reforms, including the abolition of intermediaries (zamindars) and the imposition of land ceilings on individual holdings. Its recommendations formed the basis for land reform legislation enacted by various states in the 1950s and 1960s.
Dantwala Committee (1972)	This committee, chaired by M.L. Dantwala, reviewed the progress of land reforms and identified the lack of implementation and loopholes in existing legislation as major concerns. It recommended stricter enforcement of land ceiling laws, consolidation of fragmented landholdings, and measures to improve the tenurial security of tenants.
Bhargava Committee (1974)	This committee, headed by B.S. Bhargava, focused on streamlining land records and administration. It recommended computerization of land records, simplification of procedures, and strengthening the institutional framework for land management.
Hanumantha Rao Committee (1990)	This committee, chaired by C.H. Hanumantha Rao, examined the issue of ceiling surplus land and the challenges in its distribution among landless farmers. It recommended measures to streamline the identification, acquisition, and distribution of surplus land, as well as providing support services to newly settled farmers.
National Commission on Agriculture (1976)	This commission, chaired by M.S. Swaminathan, took a comprehensive look at the agricultural sector and emphasised the importance of land reforms for achieving agricultural growth and food security. It recommended further reforms in land ownership, tenancy, and consolidation of landholdings.
Committee on State Agrarian Relations and the Unfinished Task in Land Reforms (2008)	This committee, chaired by Abhijit Sen, reviewed the progress of land reforms over three decades and identified key areas where further action was required. It recommended strengthening land records, updating land ceiling laws, and addressing emerging issues like tribal land alienation and land acquisition for industrial purposes.

Important Key Terms

Term	Definition	Key Points
Zamindari System	A historical land tenure system in India where intermediaries collected revenue on behalf of the British Raj.	Abolished in most states after independence due to its exploitative nature.
Tenancy Laws	Laws governing the relationship between landlords and tenants, including rent, land rights, and eviction procedures.	Varied widely across states, leading to inconsistencies and disputes.
Land Ceilings	Limits imposed on the amount of land an individual or family can hold.	Aim to reduce inequality and promote land redistribution, but implementation faced challenges.
Cooperatives and Joint Farming	Collective ownership and management of land resources by farmers.	Promote resource sharing, economies of scale, and improved agricultural practices.
Egalitarian Structure	A system where land distribution is equitable and promotes equal access to resources.	Aims to address historical inequalities and ensure social justice.
Land Tenure System	The legal framework governing land ownership, use, and access.	Undergoing modernization to improve transparency, efficiency, and dispute resolution.
Digitalization and Modernization of Land Records	Digitising and updating land records to improve accuracy, transparency, and accessibility.	Aims to reduce corruption, land disputes, and improve land management.
Land Acquisition	The process by which the government acquires land for public purposes.	Requires fair compensation and rehabilitation of displaced persons.
Fair Compensation	Providing adequate and timely compensation to individuals who lose land due to acquisition.	Crucial for minimizing economic hardship and ensuring social justice.
Rehabilitation and Resettlement	Supporting individuals displaced by land acquisition to rebuild their lives and livelihoods.	Includes providing housing, land, and other assistance.

Term	Definition	Key Points
Land Leasing	The agreement by a landowner to allow another person to use their land for a specified period and terms.	Can provide access to land for those who cannot afford to own it.
Land Monetization	Utilizing land resources for economic development by unlocking its value.	Can involve leasing, selling, or using land for commercial purposes.
Land Pooling	A voluntary scheme where land owners collectively pool their land for development projects.	Aims to optimize land use, improve infrastructure, and generate benefits for landowners.
RERA	The Real Estate (Regulation and Development) Act, 2016, regulates the real estate sector and protects home buyers' interests.	Aims to ensure transparency, accountability, and fair practices in the real estate market.
Benami Transaction	A transaction where the real owner of a property is different from the person in whose name it is registered.	Considered illegal and used to evade taxes and hide illegal wealth.

CONCLUSION

The effectiveness of land reforms in achieving goals like reducing rural poverty, enhancing agricultural productivity, and fostering social equity is widely debated. This discussion involves economists, sociologists, agricultural experts, and policymakers, each analyzing the reforms from their unique viewpoints and contexts. The success of these reforms is evaluated not only by the immediate land redistribution but also by their long-term effects on rural livelihoods, social structures, and economic development.

Agriculture and Allied Activities-I

13

INTRODUCTION

"Agriculture is the backbone of the Indian Economy"- said Mahatma Gandhi decades ago. Even today, the situation is still the same, with almost the entire economy being sustained by agriculture, which is the mainstay of the villages. It contributes around 15% of the overall GDP and accounts for employment of approximately 45% of the Indian population. Rapid growth in agriculture is essential not only for self-reliance but also to earn valuable foreign exchange.

Indian farmers are second to none in production and productivity despite the fact that millions are marginal and small farmers. They adopt improved agriculture technology as efficiently as farmers in developed countries. It is felt that with provision of timely and adequate inputs such as fertilisers, seeds, pesticides and by making available affordable agricultural credit /crop insurance, Indian farmers are going to ensure food and nutritional security to the Nation.

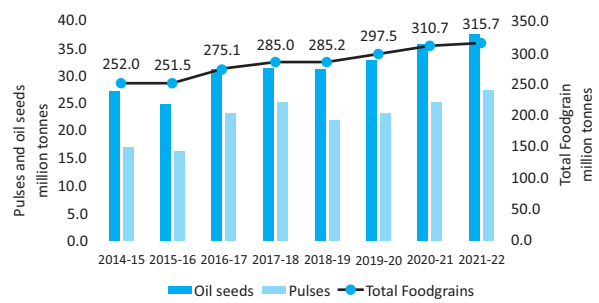
CURRENT SCENARIO OF INDIAN AGRICULTURE

- India ranks 1st in milk production and contributes 24% to global milk production, in 2021-22. It registered a 51% increase during the last 8 years, during 2014-15 to 2021-22.
- India is also the world's 2nd largest producer of food grains, fruits and vegetables and the 2nd largest exporter of sugar.
- India is the 3rd largest fish-producing country, accounting for 8% of the global fish production, and ranks 2nd in aquaculture production.
- India ranks third in production of eggs and eight in meat production in the world, said The Economic Survey 2021-22. Egg production in the country has increased from 78.48 billion in 2014-15 to 122.11 billion in 2020-21 taking the per capita availability of eggs to 91 eggs per annum in 2020-21.
- Foodgrain production in India touched 330.5 million metric tonnes (MT) in 2022-23 (3rd Advance Estimate). Moreover, India's foodgrain production touched a record 345.32 million MT in 2021-22.
- As per the First Advance Estimates for 2022-23 (Kharif only), total foodgrains production in the country is estimated at 149.9 million tonnes, higher than the average Kharif foodgrain production of the previous five years (2016-17 to 2020-21).
- As per the Budget 2022-23, ₹ 20 lakh crore (US$ 24.41 billion) agricultural credit targeted at animal husbandry, dairy and fisheries.

Foodgrains and Commercial Crops Production (MT)

Crop	2018-19	2019-20	2020-21	2022-23
Rice	116.48	118.84	124.36	135.5
Wheat	103.59	107.86	109.58	112.7
Total Cereals	263.14	274.47	285.27	350
Total Pulses	22.08	23.02	25.46	27.5
Total Foodgrains	285.21	297.5	310.74	330.5
Total Oilseeds	31.52	33.21	35.94	40.9
Sugarcane	405.41	370.5	405.39	494.2
Cotton (million bales of 170 kg each)	28.04	36.06	35.24	34.4
Jute & Metsa (million bales of 180 kg each)	9.82	9.82	9.35	9.4

Figure VIII.4: Sustained increase in Foodgrains Production in India (Million Tonnes)



Source: 1st Advance Estimates (2022-23) of DA&FW released dated 21.09.2022.

Fig. 13.1: Food grain Production in India

- Between April 2000-June 2023, FDI in agriculture services stood at US$4.75 billion. According to the Department for Promotion of Industry and Internal Trade (DPIIT), the Indian food processing industry has cumulatively attracted a Foreign Direct Investment (FDI) equity inflow of about US$ 12.15 billion between April 2000-June 2023.
- According to Bain & Co., the Indian agricultural sector is predicted to increase to US$ 30-35 billion by 2025.

ROLE OF AGRICULTURE IN INDIAN ECONOMY

Agriculture in India is not just a sector; it's the bedrock of the nation's economy and social fabric. As the primary source of livelihood for about half of the population, it holds a pivotal role in sustaining over half of India's people. The Percentage Share of GVA of Agriculture and Allied sector to Total Economy is around 20% in 2020-21 as per Ministry of Statistics and Program Implementation(MoSPI). Generally it remains in the range of 15-20 percent. While agriculture is one of the most important sectors, it has taken a comparative backseat and the service sector is leading the way.

- **Main Source of Livelihood:**
  - **Workforce:** Agriculture provides livelihoods for around 45% of India's population, directly and indirectly.
  - **Smallholder dominance:** Over 86% of farms in India are small and marginal, highlighting the sector's significance for rural communities.
- **GDP Contribution:**
  - **15 % of GDP:** Agriculture contributes a significant 15 % to India's Gross Domestic Product (GDP), showcasing its substantial economic weight.
  - **Growth engine:** While its share has gradually decreased compared to the service sector, agriculture continues to be a crucial driver of overall economic growth.
- **Industrial Backbone:**
  - **Raw material provider:** Agriculture supplies essential raw materials for various industries, like cotton for textiles, sugarcane for sugar, and oilseeds for edible oils.
  - **Market expansion:** A thriving agricultural sector leads to increased rural purchasing power, creating a larger market for industrial goods.
- **Food Security Champion:**
  - **Self-sufficiency in foodgrains:** India's success in the Green Revolution has led to self-sufficiency in foodgrain production, ensuring food security for its vast population.
  - **Global provider:** India is a major exporter of agricultural products like rice, wheat, spices, and tea, contributing to global food security and generating valuable foreign exchange.
- **Trade and Services Catalyst:**
  - **Trade enabler:** Agriculture fuels a significant portion of India's trade, with both exports and imports of agricultural products and related machinery.
  - **Service sector booster:** The success of agriculture translates to increased rural income, driving demand for services like transport, banking, and storage.
- **Government Revenue Source:**
  - **Taxation:** Land revenue and taxes on agricultural products contribute a substantial amount to the revenues of both central and state governments.
  - **Infrastructure investment:** Revenue generated from agriculture helps fund critical infrastructure projects like irrigation systems and rural roads.

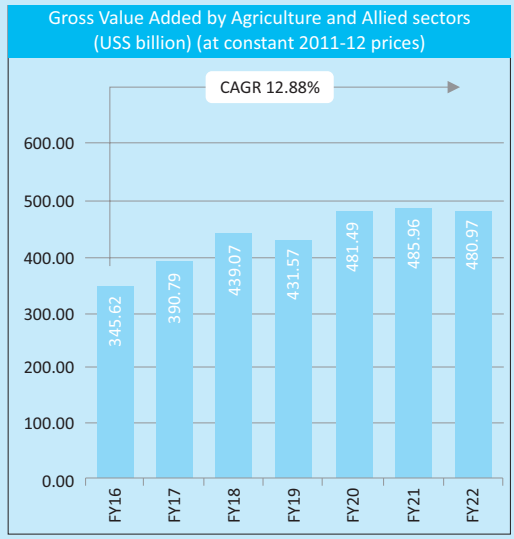
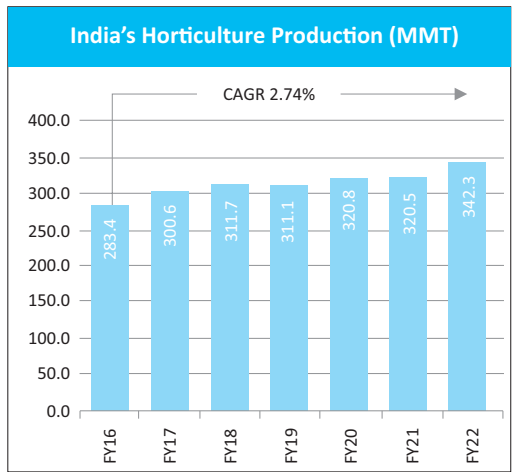
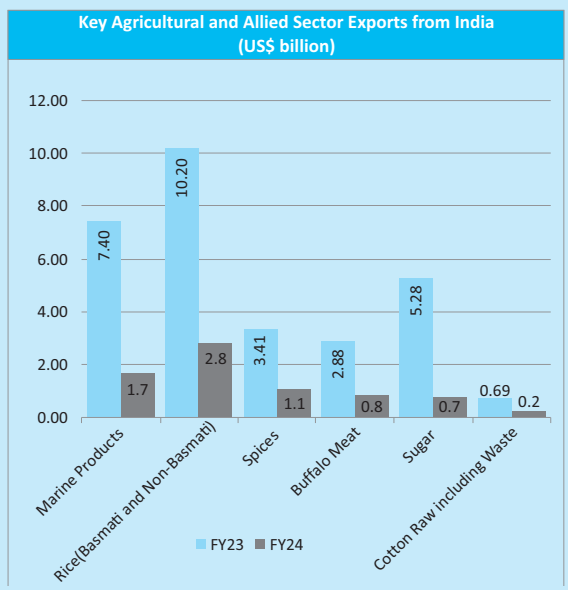
Characteristics of Indian Agriculture

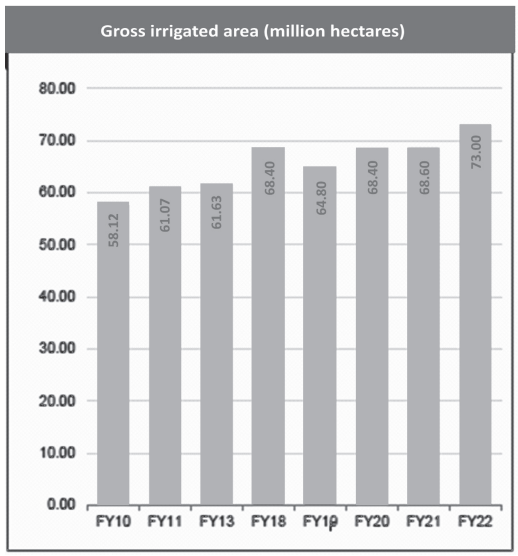
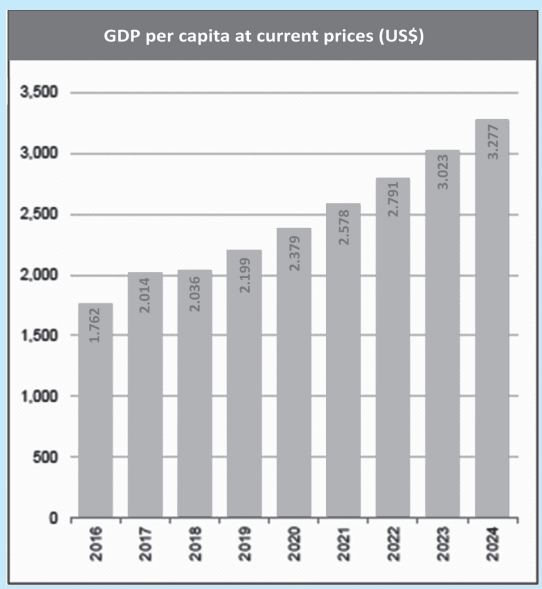
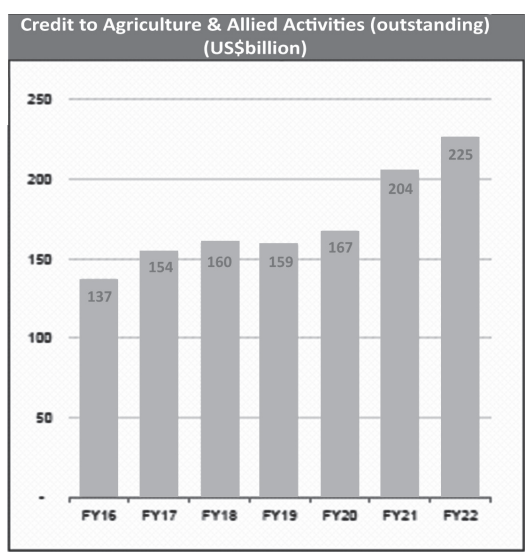
- **Subsistence-Driven:** A significant portion of Indian agriculture remains subsistence-oriented, meaning farmers primarily grow food for their own consumption and immediate families. This influences land use, crop selection, and overall market participation.
- **Predominance of Food Crops:** Over two-thirds of cultivated land is dedicated to food crops like rice, wheat, and pulses, reflecting the primary focus on food security for a large and growing population. This focus, however, can limit diversification and income opportunities for farmers.
- **Small Landholdings:** Fragmentation of landholdings is a widespread phenomenon, with the average farm size shrinking due to inheritance practices and population growth. This poses challenges for mechanisation, resource utilisation, and overall economic viability.
- **Dependence on Monsoon:** Rainfall patterns in India are heavily influenced by the monsoon, making agriculture weather-dependent and vulnerable to drought or floods. This necessitates adaptation strategies like irrigation and drought-resistant crops.

IGNITE YOUR MIND

How can technological advancements and mechanisation be leveraged to enhance productivity while ensuring the welfare of the large agricultural labour force?

- **Labor-Intensive Cultivation:** Indian agriculture relies heavily on manual labour, with limited mechanisation due to factors like land size and affordability. This contributes to high employment rates but also limits efficiency and productivity.
- **Heterogeneity and Diversity:** India's vast geography and varied climatic conditions lead to diverse agricultural practices and regional specialisations. From tea plantations in the north to cotton fields in the south, each region boasts unique crops and farming methods.

Growth In Agriculture Production	At current prices, agriculture and allied sectors account for 18.3% of India's GDP (2022-23). According to the first advance estimate of national income for FY23, the growth in GVA in FY22 was estimated at 3 per cent at constant prices. As per the third Advance Estimates of National Income, 2021-22 released by the National Statistical Office (NSO), Ministry of Statistics & Programme Implementation, the agriculture and allied sectors contributed approximately 19% of India's GVA at current prices during 2021-22.	 **Fig. 13.2:** GVA by Agriculture and Allied Sectors
Horticulture	In the current crop year (July 2022-June 2023), India's horticulture output is expected to have hit a record 350.87 million tonnes (MT), as production of fruits, vegetables, spices, and plantation crops surged dramatically. As per third Advance Estimates for FY23 total foodgrain production in the country is estimated at 330.5 million tonnes.	 **Fig. 13.3:** Trends in Horticulture Production
Agriculture export	As per the provisional figures released by the Directorate General of Commercial Intelligence and Statistics (DGCI&S), agricultural exports have grown by 19.92% during 2021-22 to touch US$ 50.21 billion. This remarkable feat has been made possible on the shoulders of several key initiatives taken by the Central government to increase the production of food grains in recent years. Marine products, rice and spices are the largest agricultural export items in terms of value. Other major export items are buffalo meat, sugar, cotton, and oil products. ❑ In FY24, exports of marine products stood at US$ 1.7 billion. ❑ In FY24, buffalo meat exports stood at US$ 0.83 billion. ❑ In FY24, sugar exports stood at US$ 0.71 billion.	 **Fig. 13.4:** Key Export Item

Irrigation	❑ In 2022-23, of the 141 million hectares of gross sown area in the country, nearly 73 million hectares, or 52%, had irrigation access. ❑ Of the wide variety of crops in India, rice and wheat are the most irrigated. ❑ Under PMKSY-Per Drop More Crop, an area of 32.697 lakh hectare (ha) has been covered under micro irrigation in the country ❑ Under PMKSY-HKKP- Repair, Renovation and Restoration of water bodies (RRR of water bodies), a total of 395 water bodies have been taken up ince 2018-19.	 **Fig. 13.5:** Gross Irrigated Area
Rising Income and Growing Middle Class	Strong growth in per capita income has resulted in greater demand for food items. Per capita GDP of India is expected to reach US$ 3,277 in 2024 from US$ 2,036 in 2018. Since our processing sector is the world's biggest with food production, supply and processing, backed by conducive conditions, its output can touch US$ 535 billion by 2025-26, while generating jobs to the tune of 9 million by 2024. Hence, other than the processing industry, packaged and ready-to-eat (RTE) food too is poised to see a huge boom.	 **Fig. 13.6:** GDP Per Capita at Current Prices
Rise in Credit and Investment	Private investment in agriculture increased to 9.3% in 2020-21. Institutional Credit to the Agricultural Sector continued to grow to Rs. US$ 226 billion (18.6 lakh crore) in 2021-22. US$ 1.66 billion (Rs. 13,681 crore) sanctioned for Post-Harvest Support and Community Farms under the Agriculture Infrastructure Fund. Free foodgrains to about 81.4 crore beneficiaries under the National Food Security Act for one year from January 1, 2023.	 **Fig. 13.7:** Credit to Agriculture and Allied Activities

Operational landholdings in India as per Agriculture Census	The total number of operational holdings in India increased by 5.86% from 138.35 million in 2010-11 to 146.45 million in 2015-16. The operating area decreased from 159.59 million ha in 2010-11 to 157.14 million ha in 2015-16, showing a decrease of 1.53%. The average size of operational holdings declined from 1.15 ha in 2010-11 to 1.08 ha in 2015-16. The percentage share of female operational holders increased from 12.79% in 2010-11 to 13.96% in 2015-16, indicating increased female participation in agriculture. Small and marginal holdings (0.00-2.00 ha) constituted 86.08% in 2015-16, with their share in the operated area at 46.94%. Semi-medium and medium operational holdings (2.00-10.00 ha) constituted 13.35% with 43.99% operated area in 2015-16. Large holdings (10.00 ha & above) comprised 0.57% of total holdings in 2015-16, with a share of 9.07% in the operated area.

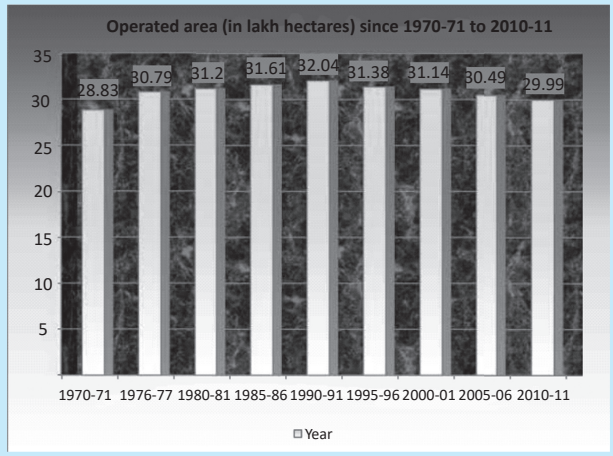


Fig. 13.8: Operated Area over the years

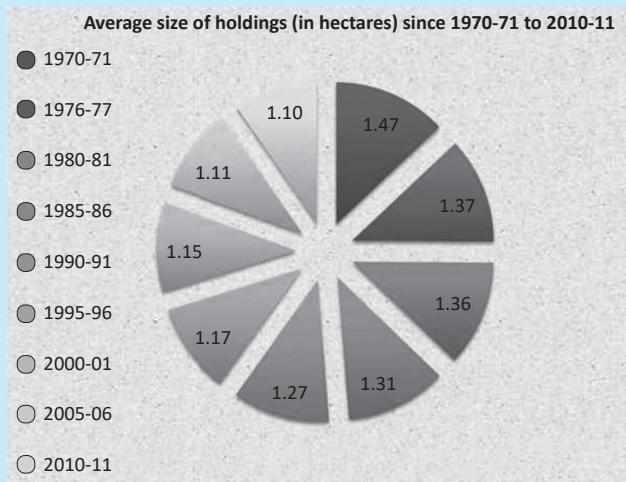


Fig. 13.9: Average Size of Holding

Challenges Facing Indian Agriculture

- **Land Fragmentation and Smallholdings:**
  - **Data:** Over 86% of operational holdings are marginal and small, with an average size below 2 hectare (2015-16 Agricultural Census).
  - **Insight:** Fragmented land limits economies of scale, mechanisation, and investment in crucial infrastructure, impacting productivity and profit-ability.
- **Low Productivity and Inefficient Resource Use:**
  - **Data:** India's average yield for major crops lag behind global averages, despite high fertiliser consumption per unit of land.
  - **Insight:** Low productivity translates to food insecurity, higher prices, and reduced income for farmers. Inefficient resource use can degrade soil health and contribute to environmental pollution.
- **Inadequate Irrigation Infrastructure and Reliance on Rainfall:**
  - **Data:** Only 52% of India's net sown area has irrigation access, with over 40% of agriculture dependent on monsoon rains.
  - **Insight:** Dependence on rainfall makes agriculture vulnerable to climate change and erratic weather patterns, leading to droughts and floods. Limited irrigation restricts cropping intensity and diverse crop choices.
- **Lack of Market Access and Post-Harvest Losses:**
  - **Data:** Nearly 40% of fruits and vegetables are lost due to poor post-harvest practices and inadequate storage facilities. Farmers often lack access to direct markets and face exploitation by middlemen.
  - **Insight:** Post-harvest losses lead to food waste and reduced income for farmers. Poor market access limits profit margins and discourages investment in agricultural production.
- **Limited Access to Technology and Knowledge:**
  - **Data:** Over 60% of the agricultural workforce is illiterate, and access to digital technologies and extension services is limited, particularly in remote areas.
  - **Insight:** Lack of technological and knowledge access hinders the adoption of innovative farming practices, precision agriculture techniques, and climate-smart solutions.

Tackling Indian Agriculture's Challenges

- **Land Fragmentation and Smallholdings:**
  - **Data-Driven Solutions:** Develop land consolidation models using spatial data to optimise land use and enable economies of scale. Utilise digital platforms for collaborative farming initiatives and resource sharing among smallholders.
  - **Government Initiatives:** Implement land titling and registration systems to improve land security and facilitate consolidation efforts. Promote cooperative farming models and provide financial incentives for collective land management.
- **Low Productivity and Inefficient Resource Use:**
  - **Data-Driven Solutions:** Implement soil health testing programs and provide farmers with personalised recommendations for fertiliser and water usage based on data analysis. Utilise precision agriculture technologies for targeted application of inputs and improved resource efficiency.
  - **Government Initiatives:** Invest in research and development of climate-resilient crop varieties and promote adoption of sustainable farming practices. Provide subsidies and training programs for precision agriculture technologies and data-driven decision making.
- **Inadequate Irrigation Infrastructure and Reliance on Rainfall:**
  - **Data-Driven Solutions:** Develop weather forecasting models and drought early warning systems to enable proactive water management and inform crop selection. Utilise remote sensing data to monitor water usage and optimise irrigation systems for efficiency.
  - **Government Initiatives:** Invest in expanding irrigation infrastructure, including micro-irrigation and water harvesting systems. Implement water pricing policies that incentivize efficient water use and discourage wastage.
- **Lack of Market Access and Post-Harvest Losses:**
  - **Data-Driven Solutions:** Develop market intelligence platforms that connect farmers directly to consumers, eliminating middlemen and ensuring fair prices. Utilise blockchain technology to track and assure product quality and provenance for better market access.
  - **Government Initiatives:** Invest in cold storage and processing facilities to reduce post-harvest losses and add value to agricultural produce. Promote farmer-producer organisations and cooperatives to improve bargaining power and market access.
- **Limited Access to Technology and Knowledge:**
  - **Data-Driven Solutions:** Develop mobile-based applications and online platforms to provide farmers with access to weather forecasts, pest alerts, and market information in local languages. Utilise AI-powered chatbots and voice assistants to offer personalised advice and support.
  - **Government Initiatives:** Invest in digital literacy programs and training initiatives to equip farmers with the skills to utilise technology effectively. Expand internet access and digital infrastructure in rural areas to bridge the digital divide.

Government Initiatives

- **Land Fragmentation and Smallholdings:**
  - **National Land Record Modernization Programme (NLRMP):** Aims to digitise land records, improving transparency and facilitating land consolidation efforts.
  - **Farm Machinery Bank Scheme:** Provides farmers with subsidised access to shared agricultural machinery, overcoming limitations of small holdings.
- **Low Productivity and Inefficient Resource Use:**
  - **Soil Health Card Scheme:** Offers free soil testing to farmers, enabling targeted fertiliser and water usage for improved yields.
  - **Pradhan Mantri Krishi Sinchai Yojana (PMKSY):** Focuses on expanding and modernising irrigation infrastructure, including micro-irrigation systems.
  - **Mission Organic Value Chain Development Scheme (MOVCD):** Promotes adoption of organic farming practices for sustainable resource management and increased soil fertility.
- **Inadequate Irrigation Infrastructure and Reliance on Rainfall:**
  - **Drought Early Warning System (DEWS):** Provides real-time weather and drought alerts to farmers, enabling proactive water management and crop selection decisions.
  - **Per Drop More Crop (PDMC) initiative:** Promotes water conservation practices like drip irrigation and rainwater harvesting to optimise water utilisation.
  - **National Watershed Management Programme (NWM):** Focuses on holistic watershed development, improving soil health, water retention, and drought resilience.
- **Lack of Market Access and Post-Harvest Losses:**
  - **e-NAM (Electronic National Agriculture Market):** Connects farmers directly to buyers across the country, eliminating middlemen and ensuring fair prices.
  - **Kisan Mandi Mobile App:** Provides farmers with real-time market information and access to e-NAM, empowering them to make informed selling decisions.
  - **One Nation, One Market initiative:** Aims to remove inter-state barriers and create a unified agricultural market, improving market access and price stability.

- **Limited Access to Technology and Knowledge:**
  - **Digital Agriculture Mission (DAM):** Focuses on developing and deploying digital tools and platforms to bridge the knowledge gap and empower farmers.
  - **Krishi Vigyan Kendras (KVKs):** Provide localised agricultural extension services, training farmers on new technologies and best practices.
  - **Farmers' Free Helpline (1800-180-1551):** Offers farmers free access to expert advice and information on various agricultural topics.

Future Outlook for Indian Agriculture

- **Embracing Data-Driven Solutions:**
  - **Strengthen data infrastructure:** Invest in sensor networks, cloud storage, and robust data governance frameworks to ensure reliable, secure, and accessible data for all stakeholders.
  - **Bridge the digital divide:** Expand internet access and digital literacy programs in rural areas to empower farmers with the skills to utilise data effectively.
  - **Develop AI-powered solutions:** Focus on precision agriculture, predictive analytics, and automated decision-making tools tailored to specific regions and crops.
- **Fostering Innovation and Technology Adoption:**
  - **Invest in research and development:** Support research into climate-smart technologies, resource-efficient practices, and next-generation crop varieties.
  - **Promote collaboration:** Create an ecosystem that fosters partnerships between startups, research institutions, private companies, and farmers.
  - **Provide financial incentives:** Make data-driven technologies and tools more affordable for farmers through subsidies and financing mechanisms.
- **Prioritising Sustainability and Resilience:**
  - **Promote soil health:** Encourage organic farming practices, soil testing, and precision fertiliser application to conserve soil fertility for future generations.
  - **Invest in water management:** Focus on expanding and modernising irrigation infrastructure, promoting water-saving technologies, and adopting drought-resistant crop varieties.
  - **Build climate resilience:** Develop early warning systems, adapt farming practices to changing weather patterns, and promote disaster preparedness measures.
- **Empowering Farmers and Strengthening Market Access:**
  - **Improve market linkages:** Develop efficient platforms like e-NAM and farmer cooperatives to connect farmers directly to consumers and reduce dependence on middlemen.
  - **Promote value addition:** Encourage post-harvest processing, cold storage facilities, and agri-business development to increase farmer income and market competitiveness.
  - **Focus on skill development:** Provide training programs on financial literacy, marketing, and entrepreneurial skills to equip farmers for a changing market landscape.
- **Ensuring Equity and Inclusiveness:**
  - **Address gender disparities:** Empower women farmers with access to land, resources, and technology to participate fully in agricultural development.

IGNITE YOUR MIND

Do you think the emphasis on agricultural exports aligns with the broader goal of ensuring food security and sustainability in India? How can the government balance the promotion of exports with the need to address domestic challenges such as post-harvest losses, market access, and the welfare of smallholder farmers?

  - **Support smallholder farmers:** Develop targeted interventions and data-driven solutions tailored to the needs of marginalised communities and resource-poor farmers.
  - **Promote data sovereignty:** Ensure farmers have control over their data and benefit from its value creation, fostering trust and ethical data practices.

By embracing these principles and implementing effective strategies, India can unlock the immense potential of its agricultural sector, ensuring food security, prosperity, and a sustainable future for its farmers and the nation as a whole.

Agriculture Census in India

The Agriculture Census in India is conducted **every five years** to gather data on the structural aspects of operational holdings in the country. This census program is implemented in three phases at five-year intervals, in collaboration with States/UTs. The Government of India provides financial, administrative, and technical support to States/UTs for the smooth execution of Census operations. The reference period for the Agriculture Census is the Agricultural year, spanning from July to June. Since the launch of first Agriculture Census in 1970-71, the country has conducted ten Agriculture Censuses so far and the present census with reference year 2021-22 will be 11th in the series. This meticulous and periodic data collection initiative plays a pivotal role in informing agricultural policies and strategies.

Operational Holding

An operational holding comprises all land utilized, either wholly or partly, for agricultural production. It operates as a single technical unit managed by an individual alone or in collaboration with others. Notably, this definition does not take into account the title, legal form, size, or location of the land.

Operated Area

The operated area encompasses both cultivated and uncultivated land, as long as a portion of it is utilized for agricultural production during the reference period. To illustrate, if an operational holding consists of four survey numbers, even if one is used for non-agricultural purposes, the total area considered will be equivalent to the overall geographical area covered by all four survey numbers.

Size Classes and Size Groups of Holdings

Data presentation occurs at both the All India level and for individual States and Union Territories. This presentation is structured based on size classes and size groups of operational holdings. This comprehensive categorization ensures a detailed analysis of the varying sizes and groups of operational holdings across regions.

S. No.	Group	Classes (in ha.)
I.	Marginal	Below 1.00 hectare
II.	Small	1.00-2.00 hectare
III.	Semi-medium	2.00-4.00 hectare
IV.	Medium	4.00-10.00 hectare
V.	Large	10.00 hectare and above

National Agriculture Policy 2000

Key features

1. Technology and Knowledge Dissemination:

- Krishi Vigyan Kendras (KVKs): 731 KVKs established, providing training and support to over 15 million farmers in improved practices.

2. Market Infrastructure Development:

- Warehouses: 4000+ cold storage facilities constructed, reducing post-harvest losses by an estimated 10%.
- Rural roads: As of financial year 2019, 45,22,228 kilometres of rural roads built, enhancing market connectivity for farmers.

3. Minimum Support Price (MSP):

- Coverage: Increased to 23 crops, providing price support to over 120 million farmers.
- Impact: Increased price stability and income security for farmers.

4. Diversification and Value Addition:

- Horticulture growth: Over 80% since 2000, reflecting a shift towards high-value crops.
- Processed food exports: Increased by over 150%, indicating growth in value addition.

5. Risk Management and Farmer Empowerment:

- Crop insurance: Over 50 million farmers enrolled, mitigating risks and protecting incomes.
- FPOs: Over 6000 FPOs registered, strengthening collective bargaining and market access.

6. Private Sector Participation:

- Food processing investment: Increased by over 200%, leading to innovation and value addition.
- Technology partnerships: Collaborations with private companies for precision farming and agri-tech solutions.

7. Sustainable Development:

- IWMP: Treated over 10 million hectares of land, promoting soil health and water conservation.
- Organic farming: Area under organic cultivation increased by over 300%, demonstrating a shift towards sustainable practices.

MAJOR CROPS AND CROPPING PATTERNS

Recent Highlights of Food Grain Production in India

- Food grain and oilseed production increased yearly in 2021-22.
- The estimated production of pulses in 2021-22 as per the Department of Agriculture and Farmers' Welfare is 26.96 million tonnes.
- Climate change negatively affects agriculture.
- In 2022, an early heat wave during the wheat-harvesting season reduced wheat production.
- Paddy sowing area decreased in the 2022 Kharif season due to late monsoons and less rainfall.
- The 2022 Kharif paddy area was 3.8 lakh hectares less than in 2021-22.
- Rabi season paddy area in 2022-23 increased by 6.6 lakh hectares compared to previous year.
- Total food grain production in 2022-23 (Kharif only) was estimated at 149.9 million tonnes, higher than the last five years' average.
- Despite reduced sown area, Kharif rice production in 2022-23 was estimated at 104.9 million tonnes, surpassing the previous five years' average of 100.5 million tonnes.

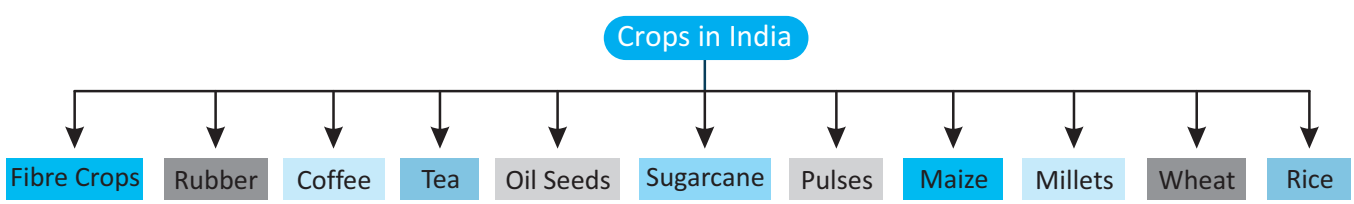


Fig. 13.10

Classifications of crops

Crop classification based on growing season:

Kharif	Season starts in June and ends in October and largely coincides with Southwest Monsoon under which the cultivation of tropical crops such as rice, cotton, jute, jowar, bajra and tur is possible.
Rabi	Season begins with the onset of winter in October-November and ends in March-April. The low temperature conditions during this season facilitate the cultivation of temperate and subtropical crops such as wheat, gram and mustard.
Zaid	Short duration summer cropping season beginning after harvesting of rabi crops. The cultivation of watermelons, cucumbers, vegetables and fodder crops during this season is done on irrigated lands. However, this type of distinction in the cropping season does not exist in southern parts of the country.

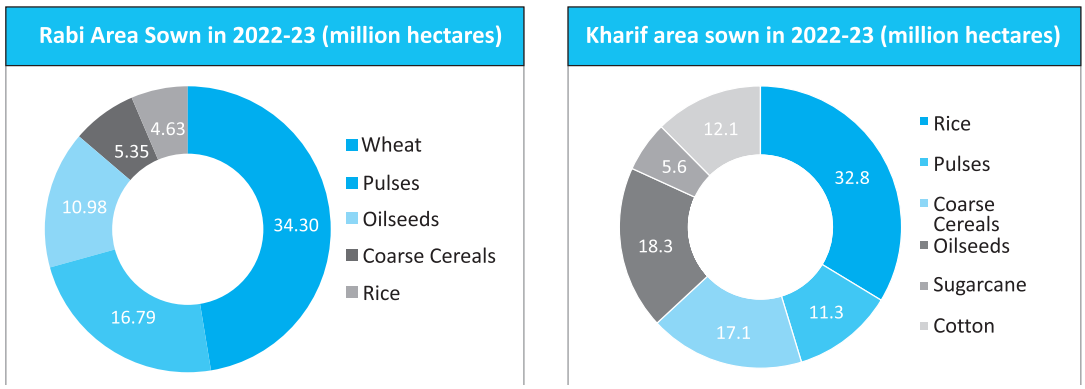


Fig. 13.11: Sown Area of Kharif and Rabi

- Monitoring of rabi crops sowing revealed that as on December 9, 2022, the area sown under rabi crops has increased from 457.80 to 526.27 lakh hectares. Out of 68.47 lakh hectares increase in all rabi crops, the increase in wheat area is 51.85 lakh hectares from 203.91 to 255.76 lakh hectares.
- Rabi crop area has increased by 3.25%, from 697.98 lakh hectares in 2021-22 to 720.68 lakh hectares in 2022-23. This is a 22.71 lakh hectare, a 13.71% increase over the average sown area in 2021-22.
- The production of kharif foodgrains in 2022-23, as per the Second Advance Estimates (AE), is estimated at 153.43 million tonnes. The production of Rabi foodgrains in 2022-23, as per the Second Advance Estimates (AE), is estimated at 170.1 million tonnes As of October 27, 2021, the total rabi area stood at 0.53 lakh hectares.

Crop Classification Based Upon Climate

Tropical	Temperate
Crops grown well in hot and warm climate	Crops grown well in cool climate
e.g. rice, sugarcane, jawar	e.g. wheat, gram, potato

Crop Classification Based On Type

Type	Description	Examples
Food crops	Crops used for human consumption	Cereals, i.e. grass like plants with starchy edible seeds having high nutritional value – rice, wheat, maize. Pulses for e.g. gram tur etc.
Cash crop	Grown for sale in raw or processed form	Cotton, jute, tobacco, castor, oilseeds
Plantation crop	Grown in plantations covering large estates.	Tea, coffee, coconut, rubber, spices, etc.
Horticulture	Fruits and vegetables	Fruits (apple, mango, bananas) and vegetables (onion, tomato etc.)

Different Types of Cropping Patterns

Cropping Pattern	Characteristics	Major Regions
Mixed Cropping	Planting different crops together to fully use resources, decrease failure risk, and improve output.	India: Wheat + Mustard (Punjab) India: Cotton + Soybean (Maharashtra) India: Maize + Groundnut (Karnataka)

Cropping Pattern	Characteristics	Major Regions
Crop Rotation	Growing crops in sequence to keep soil healthy, prevent pests and diseases, and use nutrients well.	Asia: Rice + Wheat (China, Vietnam) Asia: Rice + Mustard (India) Asia: Rice + Sugarcane (Thailand)
Intercropping	Growing different crops at the same time in one field to use space efficiently and diversify income.	Brazil: Maize + Soybean
Multiple Cropping	Planting several crops on the same land in one year to benefit from good weather and increase productivity.	India: Rice + Wheat (Punjab and Haryana) India: Aman paddy + Jute (West Bengal)
Sole Cropping	Growing only one crop on a piece of land for one season to focus on getting the highest yield, can be risky.	United States: Corn United States: Soybean United States: Wheat

Food Grains

Food grains are dominant crops in all parts of the country whether they have subsistence or commercial agricultural economy.

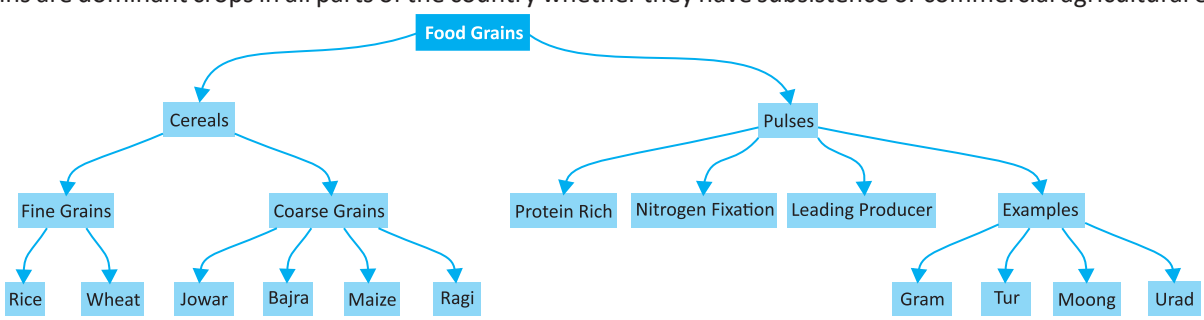


Fig. 13.12: Food Grain Classification

Cereals

- The cereals occupy about 54 per cent of the total cropped area in India. India produces about 11% cereals of the world and ranks 3rd in production after China and U.S.A.
- India produces a variety of cereals, which are classified as fine grains (rice, wheat) and coarse grains (jowar, bajra, maize, ragi), etc.

Pulses

- Pulses are a very important ingredient of vegetarian food as these are rich sources of proteins.
- These are legume crops which increase the natural fertility of soils through nitrogen fixation.
- India is a leading producer of pulses and accounts for about one-fifth of the total production of pulses in the world.
- The cultivation of pulses in the country is largely concentrated in the drylands of Deccan and central plateaus and north-western parts of the country.
- Pulses occupy about 11 per cent of the total cropped area in the country. Being the rainfed crops of drylands, the yields of pulses are low and fluctuate from year to year.
- Gram and tur are the main pulses cultivated in India.

In India, the dryland farming is largely confined to the regions having annual rainfall less than 75 cm. These regions grow hardy and drought resistant crops such as ragi, bajra, moong, gram and fodder crops.

Rice

Features

- Rice is a preferred staple food in southern and north-eastern India.
- India produced 42 mmt in 2018-19, 2nd highest production in the world after China.

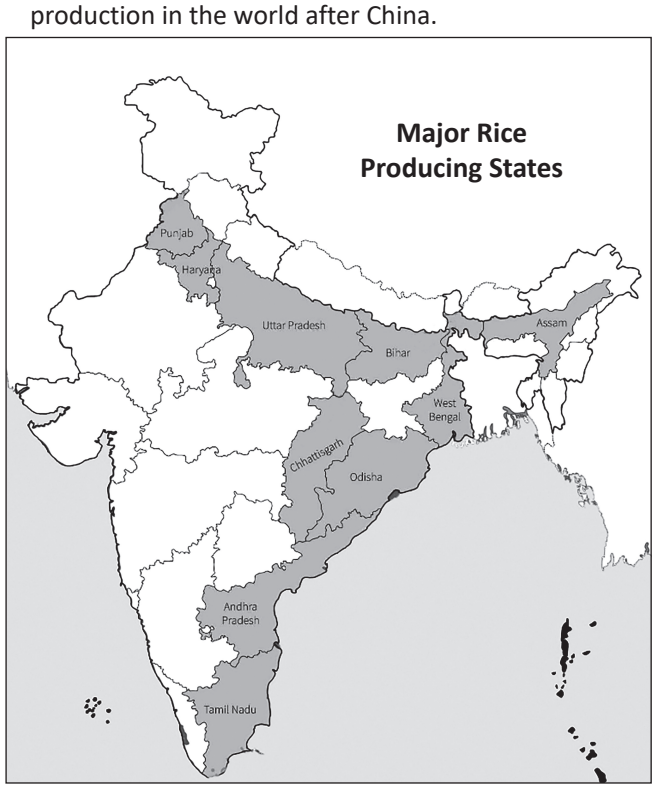


Fig. 13.13: Rice Producing States

- India had the highest export volume of rice worldwide, at 9.8 million metric tons as of 2018-2019.
- West Bengal is the largest producer followed by Uttar Pradesh.

Favourable conditions

- Rice is tropical and kharif crop (warm and wet climate is ideal)
- **Temperature:** Between 22-32°C with high humidity.
- **Annual Rainfall:** above 150 cm
- Requires semi aquatic conditions
- **Soil Type:** Deep clayey and loamy soil

Rice Cultivation Practices in West Bengal

- In West Bengal, farmers cultivate three rice crops 'aus', 'aman', and 'boro', showcasing the region's diverse agricultural practices. Additionally, the pokkali variety of rice is notable for its saltwater resistance, making it suitable for cultivation in coastal areas.

Wheat

Features

- Wheat is a preferred staple food in northern and north-western parts of India.
- India's wheat production has increased to a record 101.20 million tonnes (MT) for the crop year 2018-19 (July-June), up by 1.3% from a year ago.
- India is the second largest producer of wheat after the EU and China.
- Largest producer of wheat in India is Uttar Pradesh followed by Punjab and Haryana.

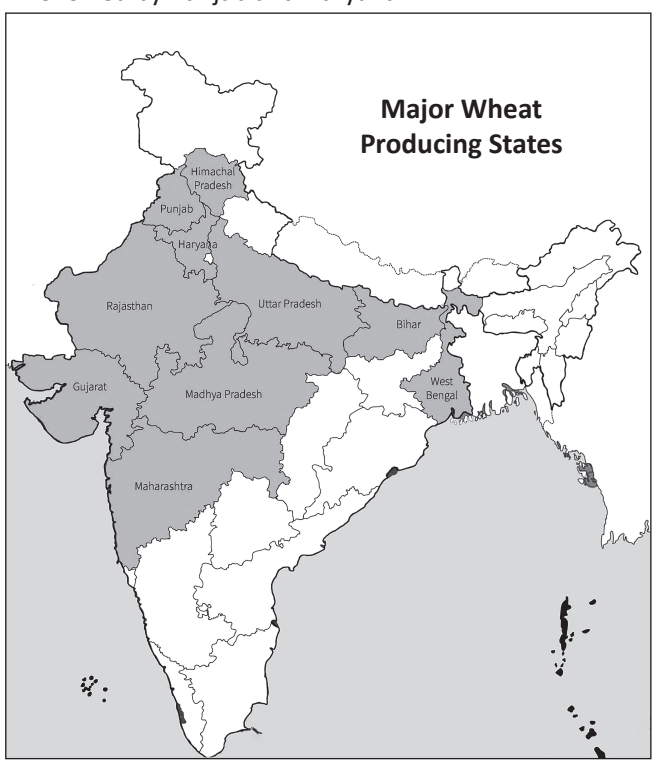


Fig. 13.14: Wheat Producing States

Favourable conditions

- **Temperature:** Between 10-15°C (Sowing time) and 21-26°C (Ripening & Harvesting).
- Wheat is a temperate crop which requires a cool climate with moderate rainfall.
- It shows great adaptability & can be grown in tropics as well (yields are low in tropics).
- Wheat is rabi crop (Winter crop)
- **Rainfall:** Around 75-100 cm.
- **Soil Type:** Well-drained fertile loamy and clayey loamy (Ganga-Sutlej plains and black soil region of the Deccan)

Maize

Features

- Maize is a food as well as fodder crop grown under semi-arid climatic conditions and over inferior soils.
- This crop occupies only about 3.6 per cent of total cropped area. The USA was the largest producer of maize contributing to about 32% of global production, followed by China (23%), Brazil (7%), Argentina (5%) and Ukraine (3%). India ranked 6th in terms of global maize production, contributing to about 2.13% respectively.
- Yield level of maize is higher than other coarse cereals. It is high in southern states and declines towards central parts.

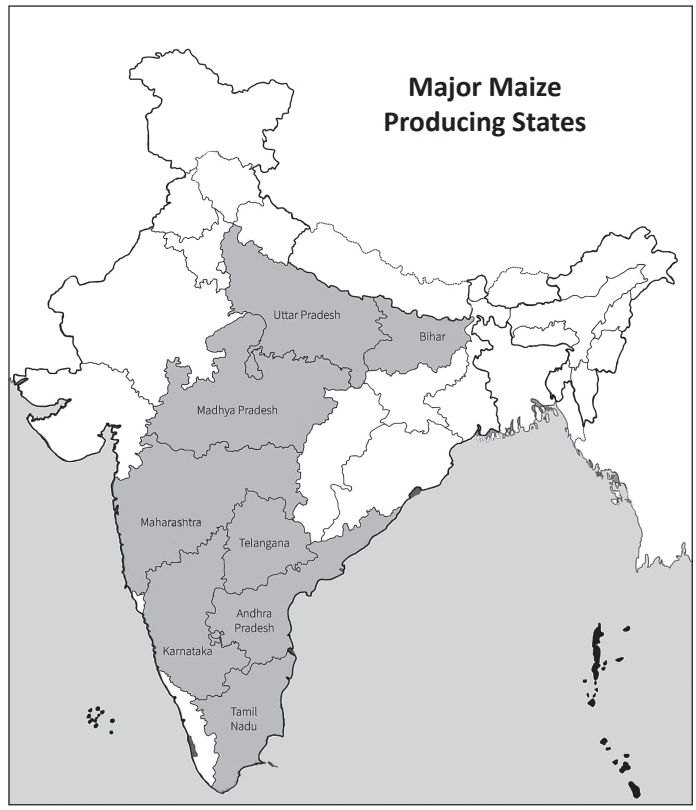


Fig. 13.15: Maize Producing States

Favourable conditions

- Maize is rainfed kharif
- Maize cultivation is not concentrated in any specific region. It is sown all over India except eastern and north-eastern regions.

Other information

- This crop occupies only about 3.6 per cent of total cropped area.

Pulses

Pulses, a diverse group of leguminous crops, have been cultivated traditionally as essential sources of protein in India. They encompass various types, including Chickpeas, Lentils, Pigeon Peas, and Mung Beans. Pulse cultivation has a rich historical background, and these crops have been integral to Indian agriculture for centuries.

- **Favourable conditions for Pulse Cultivation in India:**
  - **Temperature:** Thrives in a temperature range of 20-30°C.
  - **Rainfall:** Requires around 60-100 cm of well-distributed rainfall, with a drier period during maturation.
  - **Soil Type:** Well-suited for well-drained loamy or sandy loam soils with good organic content.

Chickpeas (Channa dal)	❑ Major producing states include Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Andhra Pradesh. ❑ Kabuli (larger-seeded) and Desi (smaller-seeded). Kabuli is often used in salads, while Desi is used in traditional Indian dishes like chana masala.
Pigeon Peas (Tur Dal)	❑ Grown in states like Maharashtra, Karnataka, Andhra Pradesh, and Madhya Pradesh. ❑ Available in red, yellow, and green, they are a crucial ingredient in Indian cuisine, used to make dals and curries.
Red Lentils (Masoor Dal)	❑ Major producing states include Madhya Pradesh, Uttar Pradesh, Bihar, and West Bengal. ❑ Known for quick cooking time and distinctive flavor, used in various dals, soups, and curries.
Green Gram (Mung Beans)	❑ Cultivated across states like Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, and Tamil Nadu. ❑ Used in soups, salads, and traditional sweets like moong dal halwa.
Black Gram (Urad Dal)	❑ Grown in states like Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, and Tamil Nadu. ❑ Used to make urad dal, a popular ingredient in Indian cuisine. Also used in dishes like dosa and idli.
Pulses from Minor Crops	❑ Other pulses like horse gram, moth bean, cowpea, lentils, and rajma (kidney beans) are cultivated in specific regions based on agro-climatic conditions.

Millets

Millets, a diverse group of small-seeded grasses, are traditionally cultivated as cereal or fodder crops, thriving mainly during India's monsoon season. Comprising 16 varieties, including Sorghum, Pearl Millet, and Finger Millet. Millet were among the first crops domesticated by the Indus Valley civilization around 3000 BC. Today, they are grown worldwide, with India recognized as a prominent producer.

Indian Millets are nutritionally superior to wheat and rice as they are rich in protein, vitamins and minerals. They are also gluten-free and have a low glycemic index, making them ideal for people with celiac disease or diabetes.

- **Facts on Millets:ss**

India is the largest producer as well as the largest exporter of cereal products in the world. India's export of cereals stood at ₹ 96,011.42 Crore/12,872.64 USD Millions during the year 2021-22. Whereas, other cereals including wheat represent only a 25 % share of total cereals exported from India during this period.

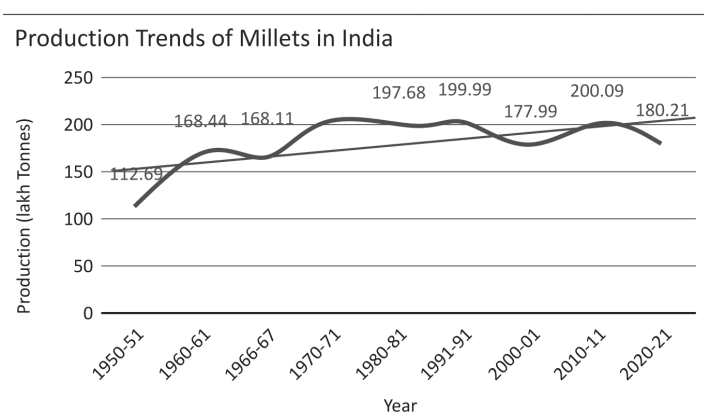


Fig. 13.16: Trends in Millet Production

Millet	Botanical Name
Pearl Millet	Pennisetum glaucum L.
Sorghum	Sorghum bicolor
Finger Millet	Eleusine coracana
Small Millets:	
I. Foxtail Millet	Setaria italica
II. Barnyard Millet	Echinochloa frumentacea
III. Kodo Millet	Paspalum scrobiculatum
IV. Proso Millet	Panicum miliaceum L
V. Little Millet	Panicum sumatrense
Two Pseudo Millets: I.Buck wheat(Kuttu)	Fagopyrum esculentum
II. Amaranthus (Chaulai)	Amaranthus viridis

- **Favourable conditions:**
  - **Temperature:** Between 26-29°c
  - **Rainfall:** Around 50-100 cm.
  - **Soil Type:** Can be grown in inferior alluvial or loamy soil because they are less sensitive to soil deficiencies.
  - India is the largest producer followed by Niger.
- **Major Millets in India:**

Jowar (Sorghum)	Jowar, or sorghum, is the third most important crop in India after rice and wheat, valued for its high nutritional content. It is grown in both Kharif and Rabi seasons, with cultivation practices varying between southern and northern states. Jowar is particularly suitable for rainfed areas and dryland farming, requiring around 30 cm of rainfall. It accounts for about 5.3% of the total cropped area in India, with Maharashtra being the leading producer, contributing more than half of the country's total jowar production. Other major jowar-producing states include Karnataka, Madhya Pradesh, Andhra Pradesh, and Telangana.
Bajra (Pearl Millets)	Bajra, or pearl millet primarily grown in regions with 40-50 cm of annual rainfall. It thrives in hot and dry climates, particularly in the northwestern and western parts of the country. Bajra is known for its resilience to dry spells and drought, making it a staple in regions prone to these conditions. It occupies about 5.2% of the total cropped area and is mainly cultivated in Maharashtra, Gujarat, Uttar Pradesh, Rajasthan, and Haryana.
Ragi (Finger Millet)	Prefers drier South Indian climates, requires moderate rainfall, cultivated in diverse soils.

- **Benefits of Millets:**
  - Millets are highly adaptive to various ecological conditions, thriving in rain-fed and arid climates with minimal water, fertilizer, and pesticide requirements. They are drought-resistant, have a short growing season, and are environmentally friendly, making them resilient in rain-fed conditions. Millets are also a health-promoting and nutritious crop, with a superior micronutrient profile, low Glycaemic Index (GI), and beneficial effects on conditions like diabetes, hyperlipidemia, and high blood pressure. In India, millets are often consumed with legumes, enhancing protein content and digestibility. Millet cultivation also helps reduce the carbon footprint and is preferred as a fodder crop, supporting both agriculture and livestock husbandry.
- **Initiatives to Promote Millet Consumption:**
  - Declared as Nutri-Cereals by the Union Agriculture Ministry in 2018.
  - 2018 marked as "National Year of Millets."
  - India sponsored "International Year of Millets" for 2023.
  - Development of gluten extraction technology for millet flour.

Oilseeds

Drylands of Malwa plateau, Marathwada, Gujarat, Rajasthan, Telangana, Rayalaseema region of Andhra Pradesh and Karnataka plateau are oilseeds growing regions of India. Madhya Pradesh, Rajasthan, Maharashtra and Gujarat are main producers of major oilseeds accounting for over two-third area and three-fourth of production. These crops together occupy about 14 percent of the total cropped area in the country.

Favourable Conditions

- **Temperature:** Between 15-30°C
- **Rainfall:** Around 30-75 cm.
- **Soil Type:** Loam to clayey loam and well drained sandy loams.
- The oilseeds are produced for extracting edible oils.
- Groundnut, rapeseed and mustard, soybean and sunflower are the main oilseed crops grown in India.

Groundnut	• It is largely a rainfed kharif crop of drylands. But in southern India, it is cultivated during rabi season as well. • It is a tropical crop that requires 50-125 cm of rainfall. • It covers about 3.6 per cent of the total cropped area in the country. • Gujarat, Tamil Nadu, Telangana, Andhra Pradesh, Karnataka and Maharashtra are the leading producers. • Yield of groundnut is comparatively high in Tamil Nadu where it is partly irrigated. But its yield is low in Telangana, Andhra Pradesh and Karnataka.
Rapeseed and Mustard	• Rapeseed and mustard comprise several oilseeds such as rai, sarson, toria and taramira. • These are subtropical crops cultivated during rabi season in north-western and central parts of India. • These are frost sensitive crops and their yields fluctuate from year to year. • But with the expansion of irrigation and improvement in seed technology, their yields have improved and stabilised to some extent. • About two-third of the cultivated area under these crops is irrigated. These oilseeds together occupy only 2.5 per cent of the total cropped area in the country.

	❑ Rajasthan contributes about one-third production while other leading producers are Uttar Pradesh, Haryana, West Bengal and Madhya Pradesh. Yields of these crops are comparatively high in Haryana and Rajasthan.
Soyabean	❑ Soyabean is mostly grown in Madhya Pradesh and Maharashtra. ❑ These two states together produce about 90 per cent of total output of soyabean in the country.
Sunflower	❑ Sunflower cultivation is concentrated in Karnataka, Andhra Pradesh, Telangana and adjoining areas of Maharashtra. ❑ It is a minor crop in northern parts of the country where its yield is high.
Sesamum	❑ India accounts for one-third of the world production and is the largest producer. ❑ Since it is a rainfed kharif crop the production fluctuates greatly with time. ❑ Sesamum is produced in almost all parts of the country. ❑ West Bengal is the largest producing state (one-third of the total production of India). The other major producers are Gujarat, Rajasthan, Maharashtra, etc.

Cash Crops

- ❑ Cash crops are crops that are grown for sale in the market. E.g. Cotton, jute, tobacco, castor, oilseeds, sugarcane etc.
- ❑ They occupy only about 15 percent of cropped area but account for over 40 percent of agriculture production by value.

Facts about Cash Crops

Cash Crop		Production	Acreage	Yield
Cotton	Cotton is chiefly a tropical and sub-tropical crop. Cotton occupies about 4.7 per cent of the total cropped area in the country. India is the Largest producer of cotton. (2018-19) There are three cotton growing areas, i.e. parts of Punjab, Haryana and northern Rajasthan in north-west, Gujarat and Maharashtra in the west and plateaus of Andhra Pradesh, Karnataka and Tamil Nadu. Largest producer is Gujarat followed by Maharashtra. (2018-19)	**2022-23:** 341.91 lakh bales (latest reported figure) **Trend:** Production has fluctuated in recent years but generally shown an upward trend, reaching a peak of 365.19 lakh bales in 2019-20. **Comparison:** India stands among the top cotton producers globally, contributing around 25% of the total world cotton production.	**2022-23:** 120.69 lakh hectares (latest reported figure) **Rain-fed vs. Irrigated:** 67% of India's cotton is grown on rain-fed areas, while 33% is irrigated. **Global comparison:** India leads the world in cotton acreage, accounting for about 36% of the total global area under cotton cultivation.	**2022-23:** 447 kg/ha (latest reported figure) **Challenge:** Despite being a major producer, India's cotton yield lags behind several other countries, ranking 38th globally.
Jute	Jute is the second most important fibre crop in India after cotton. Humid climate (120-150 cm) with 80-90 percent relative humidity during the period of its growth. At present, India produces about three-fifths of jute production. West Bengal accounts for about three-fourth of the production in the country. Bihar and Assam are other jute growing areas. Over 99 per cent of the total jute of India is produced in just five states of West Bengal, Bihar, Assam, Andhra Pradesh and Odisha.	**2022-23 (Upto July 2022):** 384.1 lakh tonnes (latest reported figure) **Trend:** While fluctuating year-to-year, production generally shows an upward trend over the past decade. **Comparison:** India accounts for roughly 70% of the world's jute production, a truly dominant position.	**2022-23:** 660 thousand hectares (latest reported figure) **Region:** Majority of cultivation happens in eastern states like West Bengal, Bihar, and Assam. **Rain-fed vs. Irrigated:** 90% of jute acreage relies on rain-fed agriculture, highlighting its vulnerability to weather patterns.	**2022-23:** 582 kg/ha (latest reported figure) **Challenge:** Though a major producer, India's jute yield lags behind Bangladesh, a key area for improvement.

Sugar-cane	Sugarcane is a crop of tropical areas. Under rainfed conditions, it is cultivated in sub-humid and humid climates. However it is largely an irrigated crop in India. India became the largest sugarcane producer in 2018-19, beating Brazil for the first time in 16 years. In the Indo-Gangetic plain, its cultivation is largely conc-entrated in Uttar Pradesh. Sugarcane growing area in western India is spread over Maharashtra and Gujarat. Three distinct belts of sugarcane cultivation can be identified in India. Sutlej-Ganga plain from Punjab to Bihar (51 per cent of the total area and 60 per cent of the country's total production) Black soil belt from Maharashtra to Tamil Nadu along the eastern slopes of the Western Ghats. Coastal Andhra and the Krishna Valley	**2022-23 (estimated):** 494.22 million tonnes (Mt) **Record:** 500.06 Mt achieved in 2021-22 **Trend:** Upward trend in recent years, with minor fluctuations.	**2022-23 (estimated):** 58.83 lakh hectares (ha) **Top Producer:** Uttar Pradesh leads the states with 225.22 Mt production in 2022-23. **Geographical spread:** Cultivated across 21 states, with major players in the south and west.	**2022-23 (estimated):** 84 tonnes/ha **Leading state:** Tamil Nadu boasts the highest yield at 104.78 tonnes/ha in 2022-23. **Improvement focus:** Yield increase remains a key area for boosting sugar production.

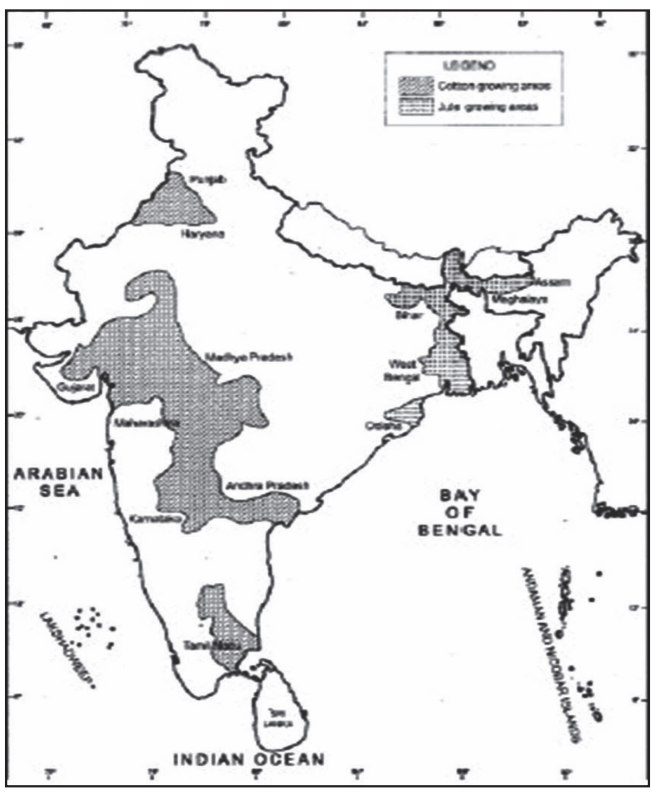


Fig. 13.17: Cotton Producing States

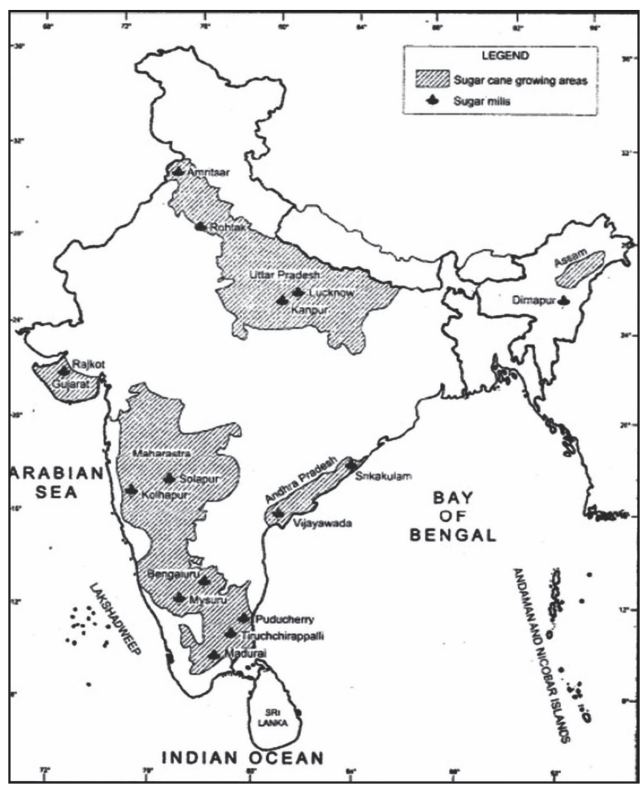


Fig. 13.18: Sugar Producing States

Types of Cotton	
Long staple cotton	It has the longest fibre whose length varies from 24 to 27 mm. The fibre is fine and lustrous and is used for making superior quality cloth. About half of the total cotton produced in India is long staple. It is largely grown in Punjab, Haryana, Maharashtra, Tamil Nadu, Madhya Pradesh, Gujarat and Andhra Pradesh.
Medium staple cotton	The length of its fibre is between 20 mm and 24 mm. About 44 per cent of the total cotton production in India is of medium staple. Rajasthan, Punjab, Tamil Nadu, Madhya Pradesh, Uttar Pradesh, Karnataka and Maharashtra are its main producers.
Short staple cotton	This is inferior cotton with fibre less than 20 mm long. It is used for manufacturing inferior cloth and fetches less price. About 6 per cent of the total production is of short staple cotton. U.P, Andhra Pradesh, Rajasthan, Haryana and Punjab are its main producers.

Plantation Crop

A plantation is a large-scale estate meant for farming that specialises in cash crops. The crops that are grown include cotton, coffee, tea, cocoa, sugar cane, sisal, oil seeds, oil palms, fruits, rubber trees and forest trees.

Tea

Favourable conditions

- **Temperature:** Between 20-30°C
- **Rainfall:** Around 150-300 cm.
- **Soil Type:** Deep and fertile well-drained soil, rich in humus and organic matter.
- Tea leaves have a rich content of caffeine and tannin.
- It is an indigenous crop of hills in northern China.
- It is grown over undulating topography of hilly areas and well drained soils in humid and sub-humid tropics and sub-tropics.

Other information

- India is the second largest producer of tea in the world (2019), producing an average 1,325,050 tonnes each year.
- Assam is the largest producer among Indian states.
- India is the fourth largest exporter after China, Sri Lanka and Kenya.
- 14% of global tea exports and nearly 20% of the tea produced in the country is exported, according to Tea Board India.
- Declining export because India's Assam CTC Tea faces competition from Kenya while orthodox tea faces competition from Sri Lanka & Mozambique.

Coffee

Favourable conditions

- **Temperature:** Between 15-28°C
- **Rainfall:** Around 150-250 cm.
- **Soil Type:** Well drained, deep friable loam soil.
- Coffee is a tropical plantation crop. Its seeds are roasted, ground and are used for preparing a beverage.

Other information

- There are three varieties of coffee i.e. Arabica, Robusta and Liberia. India mostly grows superior quality coffee, Arabica, which is in great demand in the International market.
- Coffee cultivation requires plenty of cheap and skilled labour.
- Northern and eastern aspects of slopes are preferred as they are less exposed to strong afternoon sun and the south-west monsoon winds.
- Karnataka produces more than 70% of Coffee followed by Kerala.
- Almost the entire production is shared by three states namely Karnataka (71%), Kerala (22%) and Tamil Nadu (6.5%).

Rubber

- Rubber is obtained from the latex of Hevea brasiliensis and many other tropical trees. It begins to yield latex 5-7 years after planting.
- Hevea brasiliensis requires hot (25°-35°C) and humid climate (200 cm). The rainfall should be well distributed throughout the year.
- Deep well drained loamy soils are best suited for rubber plantations.
- Almost entire rubber is produced in Kerala (92%), Tamil Nadu (3%) and Karnataka (2%) and Tripura (2%) is the fourth largest producer. Andaman & Nicobar Islands also produce small quantities of rubber.

Spices

- Pepper, cardamom, chillies, turmeric, ginger are some of the important spices produced in India. They are used for flavouring foodstuffs.
- Well drained sandy, clayey or red loams and laterites are best suited soils for the cultivation of most of the spices mentioned above.
- These soil conditions exist predominantly in the hilly regions of Kerala, Karnataka and Tamil Nadu.
- India is an exporter of spices. There has been a constant increase in area and production of spices in India.

Pepper	❑ Its distribution is highly concentrated in Kerala (94%), Karnataka and Tamil Nadu.
Cardamom	❑ Cardamom – 'queen of aromatic spices' – is mainly used for medicines. India produces a major part of the world's total cardamom. ❑ The entire production comes from three states viz., Kerala (53%), Karnataka (42%) and Tamil Nadu.
Chilies	❑ Andhra Pradesh and Telangana are the largest producers of chilies. ❑ Guntur, East Godavari and West Godavari are the major chili producing districts in AP.
Ginger	❑ India (34.60%) is the largest producer of ginger in the world. ❑ Meghalaya, Andhra Pradesh, Kerala, etc. are the main producers.
Turmeric	❑ Turmeric is native to tropical South-East Asia. ❑ India is an important producer of turmeric in the world. ❑ Maharashtra is the largest producer.

Horticulture

- ❑ India is the second largest producer of fruits and vegetables in the world after China.
- ❑ The Horticulture sector contributes about 30.4 percent of GDP from agriculture.
- ❑ India is the largest producer of bananas and mangoes.

Cashew Nut	❑ Cashew kernel is used as a dry fruit. ❑ India holds second position in the world in the production of cashew. ❑ Coasts of Maharashtra (29.9%), Andhra Pradesh (15.7%), Odisha, Kerala, Karnataka and Tamil Nadu are the major producers.
Mango	❑ Mango is the native to the Indian monsoon lands. ❑ More than half of the world's mangoes are produced in India. It is also the largest exporter. ❑ Alphonso mango is an important export variety. ❑ Uttar Pradesh, Bihar, Andhra Pradesh, West Bengal, Odisha, are the main producers.
Apple	❑ Apple is a temperate fruit crop. ❑ It requires a sunny climate with gentle winds. ❑ Partial sun reduces yields. ❑ It requires an average temperature (~22°C) during the growing season. In the non-growing season, apple crops can tolerate very low temperatures. ❑ Low temperature, rain, fog and cloudy weather hampers growth at the time of maturity. ❑ Well distributed 100-125 cm rainfall throughout the growing season is optimal. Apple orchard regions should be free from hail storms and frost. ❑ Kullu and Shimla districts in Himachal Pradesh, Kashmir Valley and hilly areas of Uttarakhand are important apple growing areas.
Banana	❑ Banana is a tropical and subtropical crop. ❑ Although cultivation is spread all over India. But peninsular India provides ideal conditions for its cultivation. ❑ Tamil Nadu and Maharashtra account for about half of total production.
Orange	❑ Most of the orange orchards are rainfed. ❑ Although orange is grown in almost all states, its cultivation is more prominently concentrated in the hilly region of Uttarakhand. ❑ Kangra valley of Himachal Pradesh, Darjeeling in W. Bengal, Khasi and Jaintia Hills in Meghalaya, Kodagu district of Karnataka are the important orange growing regions.
Peach	❑ Peach is a temperate fruit that is highly perishable (more than apple).

Factors Affecting Cropping Pattern in India

- ❑ **Climate and Rainfall:**
  - **Monsoon Dependence:** India's reliance on monsoon rains dictates the timing of major cropping seasons Kharif (summer monsoon), Rabi (winter), and Zaid (spring). Different crops are chosen based on their water requirements and adaptability to specific rainfall patterns.

- **Temperature Variations:** Regional temperature variations influence the types of crops that can thrive. For example, cooler regions in the north favour wheat, while warmer southern areas are ideal for rice cultivation.

- **Soil Type and Fertility:**
  - **Nutrient Needs:** Different crops have varying nutrient requirements. Farmers choose crops suited to the soil's natural fertility and adjust soil composition through crop rotation or organic farming practices to optimise yields.
  - **Land Degradation:** Soil degradation poses a significant challenge. Farmers may shift cropping patterns to less demanding crops or incorporate soil conservation practices to maintain long-term productivity.
- **Water Availability and Irrigation:**
  - **Limited Irrigation:** Access to irrigation plays a crucial role in determining crop choices. In areas with limited irrigation, drought-resistant crops like millets or pulses are often preferred.
  - **Uneven Distribution:** Uneven distribution of irrigation infrastructure across regions influences cropping patterns. Areas with better irrigation facilities can opt for water-intensive crops like rice, while drylands rely on more resilient options.
- **Market Demand and Economic Considerations:**
  - **Price Fluctuations:** Farmers are often influenced by market demand and price fluctuations when choosing crops. They try to cultivate crops with good market value to ensure adequate income.
  - **Storage and Transportation:** Storage and transportation facilities also play a role. Crops with shorter shelf life or higher transportation costs may be avoided in certain regions.
- **Government Policies and Incentives:**
  - **Minimum Support Prices (MSPs):** Government policies like MSPs for certain crops can influence farmer choices by guaranteeing a minimum price for their produce.
  - **Promotional Programs:** Government initiatives promoting diversification, organic farming, or specific crops can also impact cropping patterns in certain regions.
- **Cultural Practices and Traditions:**
  - **Local Preferences:** Traditional knowledge and cultural preferences often influence the types of crops grown in specific regions. Certain communities may have a long history of cultivating specific crops, leading to established patterns.
  - **Religious Beliefs:** Religious beliefs can also play a role, with some communities avoiding certain crops based on cultural or religious connotations.
- **Land Fragmentation and Holding Size:**
  - **Small Landholdings:** The widespread prevalence of small landholdings in India restricts the options for farmers. They may choose crops that require less land or can be grown intensively to maximise limited resources.
  - **Limited Mechanization:** Lack of access to advanced machinery further influences cropping patterns. Farmers may stick to crops that require less labour-intensive cultivation if they lack machinery for tasks like sowing or harvesting.

Changes in Cropping Pattern in India

- **Shift from Food to Cash Crops:** Increased cultivation of cash crops like sugarcane and cotton in Maharashtra and Punjab.
- **GM Crops:** Adoption of Bt Cotton in Gujarat and Maharashtra due to higher yield and pest resistance.
- **Organic Farming:** Sikkim's transition to fully organic farming addresses the demand for health-conscious produce.
- **Sustainable Techniques:** Use of multi-cropping and crop rotation in Punjab and Haryana to maintain soil health and improve yields.
- **Horticulture Expansion:** Growth in fruit cultivation, such as apples and cherries, in Himachal Pradesh and Jammu & Kashmir due to market demand.
- **Specialty Agriculture:** Kerala's success with spices and Karnataka's rise in floriculture showcase agricultural diversification.
- Revival of Traditional Crops: Encouragement of millet farming in Karnataka for their nutritional value and eco-friendliness.

Role of Subsidies in Cropping Pattern

Positive Impacts

- **Diversification and Balanced Land Use:** Subsidies on pulses, oilseeds, and other non-cereals can incentivize farmers to move away from the dominant rice-wheat rotation and embrace a more diverse mix of crops. This diversification balances nutrient uptake in the soil, improves soil health, and reduces pest and disease problems.
- **Increased Productivity and Technological Adoption:** Subsidies on fertilisers, seeds, and machinery can make them more affordable, encouraging farmers to adopt new technologies like high-yielding seeds, drip irrigation, and precision agriculture. This can lead to improved yields, higher incomes, and overall agricultural advancements.
- **Enhanced Food Security:** By supporting the production of essential crops like rice and wheat through subsidies, the government can ensure adequate food availability for the population, especially vulnerable sections. This acts as a safety net to combat hunger and malnutrition.

Negative Impacts

- **Distorted Cropping Patterns and Monoculture:** Inappropriate targeting of subsidies can lead farmers to prioritise subsidised crops even if they aren't suitable for the land or market conditions. This can disrupt traditional patterns, create overproduction of specific crops, and result in market gluts and price crashes.
- **Unsustainable Resource Use:** Subsidies on inputs like fertilisers and water can lead to their overuse, depleting soil nutrients, polluting water bodies, and causing long-term environmental damage. This unsustainable resource management puts future agricultural productivity at risk.
- **Inequities and Inefficiencies:** Subsidies don't always reach the intended beneficiaries, particularly small and marginal farmers who may lack access to information and resources. This creates inefficiencies in the system, exacerbates existing inequalities, and hampers their ability to fully benefit from the programs.

Way Ahead

- **Technology Integration:** A blockchain-based system could offer transparency in crop pricing and demand forecast. For example, IBM's Food Trust blockchain technology aims to track the food supply chain, which can be customised for Indian agriculture.

IGNITE YOUR MIND

Do you think a complete shift to organic farming, as seen in Sikkim, is a viable model for the entire country? What challenges and opportunities might arise in implementing such a transition on a national scale, considering factors like food security, economic viability, and environmental sustainability?

- **Financial Instruments:** Introducing futures and options in the agricultural commodity market can help farmers hedge against price volatility. For instance, a platform like Upstox or Zerodha could include a segment specially designed for agricultural commodities.
- **Policy Tweaks:** Realigning MSP with current consumption trends can help diversify the crop mix. An AI-based dynamic MSP system could adapt in real-time to domestic and global demand changes, thus guiding farmers better.
- **Quality Certification:** Introduce internationally recognized quality certifications specifically for Indian produce. This can open doors to premium markets overseas. Blockchain technology could be used to validate the authenticity of these certifications.
- **Consumer Education:** Implement nationwide campaigns to educate consumers on the benefits of consuming local and seasonal produce. Also launch a "Know Your Farmer" initiative, where QR codes on products give information about the farmer and farm it came from.
- **Community Markets:** The establishment of more farmer markets like Delhi's Dilli Haat but specialised in produce, would allow farmers to sell directly to consumers. An online version of these markets could be developed for a broader reach.

CROP DIVERSIFICATION IN INDIAN AGRICULTURE

Crop diversification involves incorporating new crops or cropping systems into a farm's agricultural production, considering the potential returns from value-added crops that align with complementary marketing opportunities. Through the application of this method, farmers can enhance their yield and, consequently, their income. Crop diversification is acknowledged as an environmentally-friendly, cost-effective, and sensible strategy for mitigating uncertainty in agriculture, especially in the face of challenges posed by climate change.

Types and Benefits of Crop Diversification

Crop Diversification Type	What It Means	Why It's Good (Benefits)
Improvement in Structural Diversity	Introduces a variety of structures within a single field of crops	Helps in controlling pests
Genetic Mix in Monoculture	Growing different varieties of the same crop together	Reduces disease; stabilises production
Fodder Grass Integration	Includes fodder grasses in the crop field	Controls pests; creates more farming options
Crop Rotation	Changing the types of crops grown in succession	Reduces diseases; stabilises output
Polyculture	Multiple crop species are grown in the same area	Controls pests, insects, diseases; increases yield and adapts to climate changes
Agroforestry	Combines growing crops with trees	Controls pests; adapts to climate changes
Mixed Landscapes	Blends various crops and farming methods across different ecosystems	Controls pests; adapts to climate changes
Micro-Watershed based Diversification	Combines crops with other farming elements for consistent income	Controls pests, insects, diseases; increases yield and employment opportunities

Need for Crop Diversification

- **Monoculture Woes:** Overdependence on single crops like rice and wheat depletes soil nutrients, fosters pest problems, and makes agriculture vulnerable to market fluctuations and climate change. Diversification is needed to break this cycle.
- **Soil Saviour:** Rotating different crops replenishes nutrients, prevents soil erosion, and promotes healthy soil microbes. It's like nurturing a diverse ecosystem within the soil itself.
- **Pest Patrol:** Monoculture attracts specific pests, while diversification disrupts their life cycle. Think of different crops as camouflage against harmful insects.
- **Market Maestro:** With diverse crops, farmers can cater to broader market demands and reduce dependence on one staple's price swings. It's like having a basket of fruits, not just one apple.
- **Climate Crusader:** Different crops have varying climate tolerances. Diversification allows farmers to adapt to changing weather patterns and choose resilient varieties, making agriculture more robust in the face of climate challenges.

Benefits of Crop Diversification

- **Sustainable Soil Health:** Improved soil fertility leads to higher yields and reduces the need for chemical fertilisers, promoting long-term sustainability.
- **Enhanced Biodiversity:** Diverse crops attract pollinators and beneficial insects, creating a thriving ecosystem and reducing dependence on pesticides.
- **Reduced Risk and Increased Resilience:** A wider range of crops makes agriculture less vulnerable to specific pest outbreaks, price fluctuations, or weather events.
- **Improved Food Security:** By growing a variety of nutritious crops, communities can have access to a more balanced diet and be less reliant on imports.
- **Empowered Farmers:** Diversification offers farmers greater control over their land and income, leading to improved livelihoods and economic opportunities.

Challenges in Crop Diversification

- **Policy Misaligned:** Existing subsidies often favour monoculture crops, making diversification less attractive. Reforms are needed to incentivize diverse cropping patterns.
- **Market Hurdles:** Small farmers may lack access to markets and information about profitable diverse crops. Improved market linkages and extension services are crucial.
- **Knowledge Gap:** Awareness about the benefits and practices of diversification needs to be spread among farmers through education and training programs.
- **Land Limitations:** Small landholdings can restrict the ability to implement diverse cropping patterns. Innovative solutions like intercropping and vertical farming can help.
- **Resource Constraints:** Implementing diversification may require additional resources like water availability machinery, and storage facilities, posing challenges for some farmers.

Government Initiatives

- **Rashtriya Krishi Vikas Yojana (RKVY):** This scheme implements various sub-schemes like Crop Diversification Programme (CDP) to encourage farmers to shift from water-intensive crops like rice to pulses, oilseeds, and coarse cereals.
- **Mission for Integrated Development of Horticulture (MIDH):** This program focuses on increasing the production, processing, and marketing of diverse horticultural crops like fruits, vegetables, and spices.
- **Soil Health Card Scheme:** This initiative provides farmers with personalised soil health cards which recommend soil-specific nutrient management practices, promoting sustainable diversification.
- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** This crop insurance scheme covers a wider range of crops beyond staple cereals, encouraging farmers to adopt diverse cropping patterns.
- **Millet Promotion:** Ahead of the International Year of Millets, the government outlines **'Seven Sutras'** focused on production, health benefits, value addition, entrepreneurship, awareness, international outreach, and policy reforms.
- Many states have implemented their own crop diversification programs tailored to their specific needs and regional advantages. For example, Karnataka has the "Karnataka Diversification of Agriculture Project," while Andhra Pradesh has the "YSR Rythu Bharosa - Crop Diversification."

Future Outlook of Crop Diversification

Embracing crop diversification requires a multi-pronged approach:

- **Policy Reforms:** Revise subsidy policies to promote sustainable and diverse cropping practices.
- **Infrastructure Development:** Invest in irrigation, storage, and processing facilities to support diverse crops.
- **Market Access:** Improve market linkages and information dissemination for farmers to connect with diverse buyers.
- **Extension Services:** Provide education and training on diversification techniques, soil management, and climate-resilient practices.
- **Research and Development:** Focus on developing high-yielding, pest-resistant varieties of diverse crops suitable for Indian conditions.

Despite some hurdles, promoting crop diversification could significantly boost farmers' earnings and strengthen national food security. Therefore the Government should

extend Minimum Support Prices to crops beyond wheat and rice to encourage this practice and help preserve precious groundwater resources. Additionally, adopting advanced agricultural practices, including better livestock management and precise fertiliser use, along with field modifications, can reduce agricultural emissions and enhance agricultural efficiency.

IGNITE YOUR MIND

How can cultural perceptions and consumer preferences be aligned with the benefits of diversified agriculture for sustainable food systems?

Crop Diversification Index

- The Index of Crop Diversification serves as a metric to assess significant changes in cropping patterns, with values ranging between 0 and 1. A higher index value indicates a greater degree of diversification. The Economic Survey 2017-18 presented data analysis on the Index of Crop Diversification, revealing a diminishing trend in crop diversification for certain states, including Chhattisgarh, Haryana, Odisha, Punjab, etc., as outlined in the table below. Subsidies are identified as one of the contributing factors to this decline.
- In the most recent data available, Karnataka emerges as the leading state in terms of the highest level of crop diversification.
- Index of Crop Diversification (selected examples)

States	1994-95	2010-11	2014-15	Remarks
Chhattisgarh	NA	0.503	0.491	Decreased over time
Haryana	0.83	0.788	0.774	Decreased over time
Himachal Pradesh	0.74	0.741	0.754	Slightly increased over time
Jharkhand	NA	0.537	0.578	Increased over time
Karnataka	0.92	0.937	0.938	Increased over time; highest in India
Odisha	0.74	0.38	0.34	Drastically decreased over time; lowest in India
Punjab	0.71	0.664	0.658	Decreased over time
West Bengal	0.55	0.663	0.654	Increased over time
All India	0.905	0.907	0.899	Decreased over time

Source: Economic Survey 2017-18

Note: Subsequent Economic Surveys did not release information on the Index of Crop Diversification.

Protected Special Agriculture Zone

When an area is designated as a Protected Special Agriculture Zone, it prohibits the approval of new project such as those associated with hydrocarbons. Only industries related to agriculture will be allowed to obtain permission for construction. Tamil Nadu has officially designated the cauvery Delta as a Protected Special Agriculture Zone

GREEN REVOLUTION

Origins and Development

- **Emergence:** Initiated in the 1960s due to the steep decline in crop production in 1957-58.
- **Government Initiatives:** Introduction of the Intensive Agricultural District Programme (IADP) in 1960-61 and the Intensive Agricultural Area Programme (IAAP) in 1964.
- **High Yielding Varieties Programme (HYVP):** Launched in 1966 for crops like wheat, rice, maize, jowar, and bajra.

Characteristics of The Green Revolution

- **Multiple Cropping:** Harvesting two or more crops annually with expanded farming areas.
- **Packaged Inputs:** Provision of HYV seeds, fertilisers, and pesticides in areas with reliable water supply.
- **Crop Focus:** Limited primarily to wheat, rice, maize, jowar, and bajra.

Major Aspects of The Green Revolution:

- **Introduction of High Yielding Varieties (HYV)**
  - **Early Yield Challenges:** The national average yield of wheat was significantly lower than that in agriculturally advanced countries in the 1960s.
  - **Role of M.S. Swaminathan:** Advocated for reorientation of breeding programmes focusing on tall varieties.
  - **Collaboration with Norman E. Borlaug:** Invited by the Indian government in 1963 to explore the use of dwarf varieties in India.
  - **Adoption of Dwarf Wheat Varieties:** Introduction of Mexican semi-dwarf varieties, Lerma Rojo and Sonora-64, leading to a surge in wheat production.
  - **Recognition:** Norman E. Borlaug received the Nobel Prize in 1970 for his contribution to the Green Revolution.
- Use of Chemical Fertilisers and Pesticides
  - **Types of Fertilisers:** Introduction of nitrogenous (e.g., ammonium sulphate, ammonium nitrate,

urea), phosphate (e.g., ammonium phosphate, superphosphate), and potassium fertilisers (e.g., potassium sulphate, potassium nitrate).
    - **Role of Pesticides:** Development and use of chemicals to control agricultural pests.
- Mechanization of Agriculture
    - **Need for Mechanization:** Increased productivity necessitated the use of machinery due to labour shortages.
    - **Types of Machinery:** Adoption of water pumps, ploughs, combine harvesters, cultivators, tractors, reapers, threshers, and mechanical pickers.
- Irrigation Techniques
    - **Requirement for HYV:** High water demand of HYV necessitated improved irrigation.
    - **Methods:** Utilisation of wells (dug and tube wells), canals, river lift systems, and tanks.

Impact of The Green Revolution

Positive Outcomes of Green Revolution

- **Increased Agricultural Productivity:** The Green Revolution led to a significant increase in agricultural yields, especially for staple crops like wheat and rice. This was largely due to the introduction of High Yielding Varieties (HYVs).
- **Enhanced Food Security:** The increase in food grain production contributed to improved food security in India, reducing the risk of famine and hunger.
- **Economic Growth:** The agricultural sector's growth spurred economic development in rural areas, leading to increased income for farmers and contributing to the overall economy.
- **Rural Infrastructure Development:** The Green Revolution prompted improvements in rural infrastructure, including roads and electrification, which facilitated better market access and quality of life for rural populations.
- **Employment Opportunities:** The agricultural intensification and mechanisation created numerous employment opportunities in both farming and related industries, such as agro-processing.

Negative Outcomes of Green Revolution

- **Environmental Degradation:** Intensive farming practices led to soil degradation, water depletion, and a decrease in biodiversity. Overuse of chemical fertilisers and pesticides also contributed to soil and water pollution.
- **Increased Inequality:** The benefits of the Green Revolution were more pronounced in regions with better access to water, finance, and infrastructure, leading to regional disparities. Wealthier farmers benefited more than smaller, marginal farmers.
- **Health Issues:** Prolonged exposure to and misuse of chemical pesticides and fertilisers led to health concerns among farmers and local communities, including cases of poisoning and long-term chronic illnesses.
- **Depletion of Groundwater:** The Green Revolution's reliance on irrigation led to overexploitation of groundwater resources, particularly in states like Punjab and Haryana, leading to a decrease in water tables.
- **Dependency on Agrochemicals:** The adoption of HYVs created a dependency on agrochemicals for optimal yields, leading to a cycle of increased use of these inputs, escalating costs, and potential environmental harm.

Challenges Post-Green Revolution

- **Shrinking Land holdings:** At present, the per capita available land is only about 0.10 hectares. This is much below the world average of about 4.50 hectares. Over 75% of the landholding are less than one hectare.

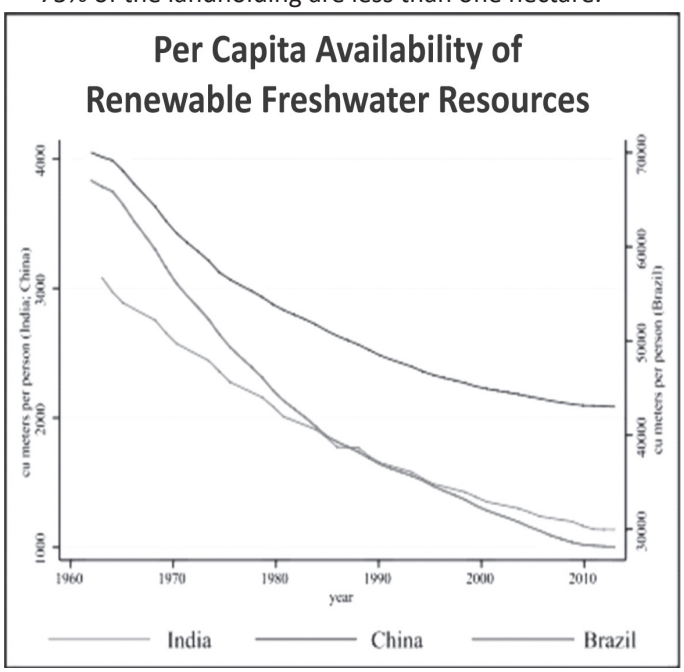


Fig. 13.19: Per capita availability of Renewable Freshwater Resources

- **Water Scarcity:** It shows that India has much lower levels of water per capita than Brazil, one of the world's leading agricultural countries. India uses a little over 90 percent of water resources for cultivation.
- **Minimum Support Price (MSP):** MSP aims to provide **guaranteed remunerative prices** to farm produce. Against this background, farmers have been demanding a **'legal status' to the MSP.**
    - A survey by the government showed that less than 6%, or over nine crore agricultural households, are the direct beneficiaries. Further, only 19% of farmer families sold paddy under MSP, whereas only 9.7% of wheat farmers benefited from MSP.
- **Climate Change:** Agriculture in India is highly vulnerable to climate change and variability and the frequency of climatic extremes has increased in recent years resulting in increased risks to agricultural production and food security.

- In the absence of the adoption of adaptation measures, rainfed rice yields in India are projected to reduce by 20% in 2050 and 47% in 2080 scenarios while irrigated rice yields are projected to reduce by 3.5% in 2050 and 5% in 2080 scenarios.

- **Limited Scope:** Productivity gains restricted to certain grains, with no significant increase in pulses and commercial crops.
- **Regional Imbalance:** Benefits primarily in states like Punjab, Haryana, Maharashtra, and Tamil Nadu.
- **Accessibility and Economic Divide:** HYV seeds were expensive for small and marginal farmers, widening the economic gap between rich and poor farmers.

Solutions To The Above Challenges

- **Need for Evergreen Revolution in India:** According to most estimates, farming is no longer remunerative and over 40 percent of farmers would like to quit if they have an option. The evergreen revolution is based on an appropriate blend of different approaches to sustainable agriculture such as organic farming, green agriculture, eco-agriculture and agriculture based on effective microorganisms.
- **Green Revolution in India 2.0:** We need to improve productivity in dry-farming areas, which can grow pulses, oilseeds and other high-value crops that require less water, but many of which we continue to import.

IGNITE YOUR MIND

Do you think the adoption of genetically modified (GM) seeds is a viable solution to enhance agricultural productivity in India? Consider the potential benefits and risks associated with GM technology, and discuss the ethical and environmental considerations in making such advancements a part of the agricultural landscape.

- **Natural Farming:** Agroecological practices like Natural Farming are a cost-effective and ecologically compatible alternative that can help achieve the Sustainable Development Goals. They can reduce input costs, improve income and financial stability, alleviate poverty, promote gender equality, and ensure sustainable production and consumption patterns.
- **Cooperative Farming:** It was, therefore, necessary to make cost-effective usage of new technology on small and marginal-size holdings through some institution-building measures like the formation of group farming.
- **Green Revolution to Gene Revolution:** GM seeds are considered to be more productive, more pest-resistant and more suitable to all categories of farms and all the agricultural regions.
- However, the adoption of gene technology in Indian agriculture is subject to debate and discussion, as its positive and negative effects on plants, animals and human lives have not yet been fully examined.

Green Revolution 2.0

Aimed at enhancing agricultural adaptability and resilience to evolving climatic and socio-economic conditions. Focus on ensuring food and nutrition security for current and future generations.

Key Features of Green Revolution 2.0

- **Biotechnology and Genetic Engineering:** Green Revolution 2.0 emphasizes developing climate-resilient, pest-resistant crops through biotechnology and genetic engineering.
- **Precision Agriculture:** This approach integrates advanced technologies like GPS and drones to optimize resource utilization, including water, fertilizers, and pesticides. It aims to enhance farming efficiency and reduce the ecological footprint.
- **Sustainability Focus:** Green Revolution 2.0 prioritizes sustainable practices that conserve soil health and reduce chemical usage, minimizing agriculture's environmental impact. It includes organic farming, agroecology, and integrated pest management.
- **Crop Diversification:** The initiative encourages cultivating a variety of crops, enhancing nutrition, reducing mono-cropping risks, and preserving biodiversity.
- **Holistic Agricultural Approach:** Recognizing agriculture's broader aspects, this approach encompasses soil health, food processing, marketing, and value addition. It focuses on integrated approaches addressing the entire food supply chain.
- **Environmental Impact Mitigation:** Green Revolution 2.0 aims to reduce negative environmental impacts like soil erosion, water pollution, and greenhouse gas emissions through sustainable practices.
- **Climate Change Adaptation:** The initiative focuses on developing climate-resilient crop varieties and practices to cope with changing weather patterns and extreme conditions.

Overview of Green Revolution Schemes (PM Krishonnati Yojana)

Initiated by Prime Minister Narendra Modi. The objective is to scientifically and holistically develop agriculture and allied sectors, increasing farmer income through higher productivity and better returns.

Key Schemes under Krishonnati Yojana

- **MIDH – Mission for Integrated Development of Horticulture:**
  - **Goals:** Boost horticulture sector growth, enhance production, improve nutritional security, and increase household farm incomes.

- **Strategies:** Establish production clusters and hubs, develop infrastructure for processing, post-harvest management, and exports.

- **NFSM – National Food Security Mission (including NMOOP):**
  - **Objectives:** Enhance production of key crops like wheat, pulses, rice, and oilseeds; focus on productivity and area expansion.
  - **Aims:** Elevate farm-level economy, restore soil fertility, reduce imports, and increase domestic availability of vegetable and edible oils.
- **NMSA – National Mission for Sustainable Agriculture:**
  - **Focus:** Promote sustainable agricultural practices suitable to specific regions, focusing on integrated farming and soil health.
  - **Benefits:** Reduce farming costs through sustainable methods, increase farmer income, and produce chemical-free, nutritious food.
- **SMAE – Submission on Agriculture Extension:**
  - **Goals:** Strengthen state government extension mechanisms, achieve food security, and empower farmers socio-economically.
  - **Approaches:** Enhance program planning, support human resource development, promote innovative media usage, and integrate ICT tools.
- **SMSP – Sub-Mission on Seeds and Planting Material:**
  - **Objectives:** Boost quality seed production, enhance farm-saved seed quality, strengthen the seed multiplication chain.
  - **Methods:** Introduce new technologies in seed production and processing, modernise infrastructure for seed production and certification.
- **SMAM – Sub-Mission on Agricultural Mechanisation:**
  - **Aims:** Expand farm mechanisation to small and marginal farmers, promote Custom Hiring Centres.
  - **Strategies:** Develop hubs for high-tech equipment, conduct demonstrations, ensure performance testing, and certification.
- **SMPPQ – Sub Mission on Plant Protection and Plant Quarantine:**
  - **Purpose:** Reduce agricultural crop losses due to pests and diseases, protect agricultural biosecurity.
  - **Activities:** Facilitate agricultural exports, promote good agricultural practices in plant protection.
- **ISACES – Integrated Scheme on Agriculture Census, Economics, and Statistics:**
  - **Objectives:** Conduct agriculture censuses, research on agro-economic issues, study crop cultivation costs.
  - **Initiatives:** Fund conferences and workshops, improve agricultural statistics methods, create crop conditions and production information systems.
- **ISAC – Integrated Scheme on Agricultural Cooperation:**
  - **Goals:** Provide financial support to cooperatives, reduce regional imbalances, develop agricultural processing and storage.
  - **Focus:** Ensure quality yarn supply to weavers, assist cotton growers in getting fair prices through value addition.
- **ISAM – Integrated Scheme on Agricultural Marketing:**
  - **Aims:** Develop agricultural marketing infrastructure, promote innovative technologies.
  - **Initiatives:** Provide facilities for grading and standardisation, establish a nationwide marketing network, integrate markets through online platforms.

IGNITE YOUR MIND

Do you think Green Revolution 2.0, with its emphasis on sustainability and holistic approaches, can effectively address the environmental concerns associated with traditional Green Revolution practices?

- **NeGP-A – National e-Governance Plan:**
  - **Purpose:** Offer farmer-centric services, enhance access to information and services throughout the crop cycle.
  - **Strategies:** Integrate existing ICT initiatives, improve program efficiency, and facilitate timely information delivery to farmers.

HORTICULTURE

The horticulture sector in India blooms with vibrancy, playing a crucial role in enriching lives and economies.

Significance

- **Nutritional Bounty:** From juicy fruits and crisp vegetables to fragrant flowers and nuts, horticulture provides diverse and essential nutrients for millions, contributing to food security and well-being.
- **Livelihood Blossoms:** It nurtures countless livelihoods, directly employing over 15 million people in cultivation, processing, and allied industries, empowering rural communities and driving economic growth.
- **Export Flourish:** India ranks among the leading exporters of horticultural products, earning valuable foreign exchange and boosting national prosperity.
- **Environmental Enhancer:** Horticulture fosters green spaces, improves air quality, and promotes biodiversity, contributing to a healthier planet.

Composition

- **Fruits:** Mangoes, bananas, grapes, and apples are just a few of the vibrant tapestry of fruits grown in India, delighting taste buds and providing vital vitamins.

- **Vegetables:** From humble potatoes and tomatoes to exotic okra and brinjal, vegetables fuel healthy diets and add flavour to every meal.
- **Flowers:** Vibrant roses, fragrant jasmine, and majestic lilies paint India's landscape with beauty, contributing to cultural ceremonies and festive cheer.
- **Spices:** Aromatic spices like turmeric, ginger, and chilies not only add zest to cuisine but also possess medicinal properties and fuel export markets.

Challenges

- **Climate Concerns:** Erratic weather patterns, droughts, and floods pose challenges for cultivation, requiring adaptation and resilience strategies.
- **Post-Harvest Losses:** Inadequate infrastructure and storage facilities lead to substantial losses of produce, hindering profitability and food security.
- **Market Fluctuations:** Fluctuating prices and dependence on middlemen can impact farmer income and market stability.
- **Resource Constraints:** Limited access to water, land, and technology can hinder productivity and growth, especially for small-scale farmers.

Opportunities

- **Technology Adoption:** Embracing precision agriculture, smart irrigation systems, and disease-resistant varieties can enhance productivity and resilience.
- **Value Addition:** Processing and creating value-added products like jams, juices, and dried fruits can increase profitability and reduce post-harvest losses.
- **Cold Chain Development:** Expanding cold chain infrastructure across the country can minimise spoilage, ensure fresher produce, and widen market reach.
- **Brand Building:** Promoting unique horticultural products like Alphonso mangoes and Darjeeling tea can build brand recognition and fetch premium prices.

Government Initiatives

The Indian government nurtures the sector through various initiatives:

- **Mission for Integrated Development of Horticulture (MIDH):** Focuses on infrastructure development, technology adoption, and market access.
- **Scheme for Skill Development in Horticulture:** Enhances skills and knowledge of farmers for better production and management practices.
- **Kisan Credit Card Scheme:** Provides access to credit for horticulture farmers and entrepreneurs.

Mission for Integrated Development of Horticulture (MIDH)

MIDH is a government program started in 2014-15 by the Ministry of Agriculture and Farmers Welfare. Its purpose is to enhance the entire horticulture sector, which includes different types of crops like fruits, vegetables, mushrooms, spices, and more.

Funding: The Indian government pays 85% of the costs for these horticulture projects across most of India. However, for the North Eastern and Himalayan regions, it pays 100%. The remaining costs are covered by state governments.

Objectives of MIDH

- Formation of Farmer Groups: The scheme focuses on forming groups like FIGs, FPOs, and FPCs. This helps farmers work together efficiently, increase horticulture production, improve income, and ensure better nutrition.
- Boosting Productivity: By using high-quality seeds and efficient water usage, the scheme aims to increase the productivity of horticultural crops.
- Skill Development and Employment: It supports training and job creation for young people in areas like horticulture, handling crops after harvest, and cold chain sector.
- **Capacity Building:** The scheme also involves training farmers to use advanced technology. This is done through Krishi Vigyan Kendras, state agriculture universities, and horticulture departments in states.

Sub-Missions of MIDH

- National Horticulture Mission (NHM): This focuses on improving horticulture in 18 States and 6 Union Territories, managed by State Horticulture Missions.
- Horticulture Mission for North East & Himalayan States (HMNEH): This mission aims to develop horticulture specifically in the North East and Himalayan states.
- National Horticulture Board (NHB): The NHB works on various horticulture-related projects across all Indian States and Union Territories.
- Coconut Development Board (CDB): The CDB focuses on enhancing coconut cultivation in all the coconut-growing states in India.
- Central Institute for Horticulture (CIH): Established in Nagaland in 2006-07, CIH provides training and support to farmers and field workers in the North Eastern Region.

Strategies of MIDH

- End-to-End Approach: Covering everything from before production starts to after the crops are harvested, including processing and marketing, to ensure farmers get fair returns.

- Promoting Research and Development: Emphasising on cold chain infrastructure to extend the shelf life of perishable products and technologies for better cultivation, harvesting, and processing.
- Enhancing Productivity: This includes diversifying crops, adopting high-tech farming methods, expanding the cultivation of orchards, and improving post-harvest management and marketing.
- Collaborative Approach: Working together with various public and private sector agencies in research, processing, and marketing at different levels.
- Supporting Farmer Organisations: Encouraging partnerships with market aggregators and financial institutions to provide fair returns to farmers.
- Educational Reform and Human Resource Development: Updating the curriculum in educational institutions related to agriculture and horticulture.

Activities of MIDH

- Establishing nurseries and tissue culture units for quality seeds and planting material.
- Expanding areas for orchards and gardens, and rejuvenating old orchards.
- Promoting protected cultivation like poly-houses and green-houses for high-value crops.
- Supporting organic farming and certification.
- Developing water resource structures and managing watersheds.
- Encouraging bee-keeping for pollination.
- Enhancing horticulture mechanisation.
- Building infrastructure for post-harvest management and marketing.

MECHANIZATION OF AGRICULTURE

Mechanisation plays a pivotal role in modern agriculture, serving as a crucial input to enhance agricultural productivity. As the availability of water resources and the labour force diminish while the cultivated area shrinks, the adoption of mechanisation becomes imperative for improving agricultural efficiency in both production and post-harvesting operations.

Farm mechanisation can be integrated at various stages of the agricultural production process:

- Seedbed preparation
- Sowing/planting/transplanting
- Weeding, interculture, and plant protection
- Harvesting and threshing

The advantages of farm mechanisation include the effective utilisation and savings in inputs such as water, labour, energy, and fertilisers. It enables timely farm operations, facilitates quicker crop rotation, enhances crop productivity, and contributes to increased farmer income.

To emphasise farm mechanisation, the government launched a sub-mission on agricultural mechanisation in 2014-15. Under this initiative, state governments receive assistance to provide training, demonstrate agricultural machinery, and offer financial support to farmers for machinery procurement and the establishment of custom hiring centres.

As of the Economic Survey 2019-20, India's farm mechanisation rate remains comparatively lower (40-45%) than countries like the United States (95%), Brazil (75%), and China (57%). Maximum mechanisation in India has been observed at the seedbed preparation level, with wheat exhibiting the highest mechanisation among crops.

The Low Rate of Mechanisation in India can Be Attributed To Several Factors, as Identified by a 2021 Study

- The majority of farmers operate on small holdings, preventing effective economies of operation.
- Limited access to the power required for agricultural machinery.
- High credit costs and complex loan disbursement procedures.
- Uninsured markets.
- Low awareness among farmers about the benefits of farm mechanisation.

As per the Economic Survey, Use of proper equipment can increase farm productivity by up to 30% and reduce the input cost by about 20%.

Tractor accounts for most of the farm mechanisation in India. The country is also the largest market in the world for tractors.

TECHNOLOGY MISSION IN AGRICULTURE

Technology Missions in agriculture are targeted initiatives aimed at leveraging modern technology to address specific challenges and enhance productivity in the agricultural sector. These missions are characterised by clearly defined objectives, timelines, and measurable outcomes.

Background

The concept of Technology Missions in agriculture was introduced in 1986 with the launch of the Technology Mission on Oilseeds, Pulses, and Maize (TMOPM) in India. This marked a strategic effort to boost agricultural production, reduce dependency on imports, and improve the overall efficiency of farming practices. Thereafter it expanded to include:

Various Technology Missions

Technology Missions	Related Description
Restructured National Bamboo Mission (NBM)	❑ Approved by the Cabinet Committee for sustainable bamboo cultivation and processing.
	❑ Under MIDH, Government of India (GOI) contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas, 40% share is contributed by State Governments. In the case of North Eastern States and Himalayan States, GOI contributes 90%.
National Horticulture Board (NHB) schemes	❑ Addresses commercial horticulture development via institutional financing. - Applied in all States and UTs.
Coconut Development Board (CDB) schemes	❑ Promotes coconut production in States and UTs producing coconut.
Central Institute of Horticulture (CIH), Nagaland schemes	❑ Focuses on HRD and capacity building in NE states.
National Mission on Agriculture Extension and Technology (NMAET)	❑ Approved in 2014 with four Sub Missions.
	❑ Focuses on awareness, seed quality, agricultural mechanisation, and plant protection.
National Mission on Oilseeds and Oil Palm (NMOOP)	❑ Aims to increase seed replacement ratio and irrigation coverage.
	❑ Includes three mini missions for oilseeds, oil palm, and tree-borne oil.
National Saffron Mission	❑ Aims to increase saffron production and quality in Jammu and Kashmir.
	❑ Supports irrigation facilities and quality control labs.
Technology Mission on Citrus	❑ Focuses on disease-free citrus planting material, HRD, and orchard rejuvenation.
Technology Mission on Coconut	❑ Covers pest and disease management, processing, market research, and promotion.
Technology Mission on Oilseeds, Pulses, and Maize (TMOP)	❑ Includes various programs for oilseeds, pulses, maize, and more.
Jute Technology Mission	❑ Aims for the overall development of the jute industry with four mini missions.
	❑ Focuses on improving yield, technology transfer, market linkage, and modernization.
Technology Mission on Cotton (TMC)	❑ Aims to improve cotton yield and quality through better varieties and technology.
	❑ Has four mini missions for research, technology transfer, market infrastructure, and modernization.
Sugar Technology Mission	❑ Collaborative effort to upgrade sugar industry technology and achieve efficient production.
National Mission on BioDiesel	❑ Aimed to supplement petroleum with biodiesel fuel, emphasising Jatropha and Pongamia.
National Mission on Food Processing	❑ Launched in 2012 for modernising food processing, establishing mega food parks, and more.
National Food Security Mission	❑ Launched in 2007 to improve production of rice, wheat, pulses, and commercial crops.
	❑ Focuses on technology transfer, training, and crop-specific missions.
National Mission on Medicinal Plants	❑ Aims to support cultivation of medicinal plants on private land and their post-harvest management.
National Mission on Micro-Irrigation	❑ Supported on-farm water management and merged into “Per Drop More Crop” under PMKSY.
National Mission for Sustainable Agriculture (NMSA)	❑ Part of NAPCC for making agriculture sustainable and climate resilient with integrated farming, soil health, and water management.
	❑ Includes Rain-fed Area Development and Soil Health Management components.

Benefits of Technology Missions

- **Enhanced Productivity and Efficiency:** Precision agriculture techniques like soil sensors, data-driven decision making, and automation can optimise resource use, leading to higher yields and improved efficiency. This translates to less waste, lower input costs, and increased profitability for farmers.
- **Sustainable Practices and Environmental Protection:** Technologies like renewable energy solutions for irrigation, biofertilizers, and climate-smart practices can reduce environmental impact and promote sustainable agricultural practices. This includes combating soil degradation, reducing water usage, and mitigating climate change effects.

- **Improved Market Access and Livelihoods:** Digital platforms like e-mandis and market information systems can connect farmers directly to markets, enhancing access and fair remuneration. This empowers farmers economically and improves their livelihoods.
- **Reduced Food Waste and Loss:** Advanced logistics and storage technologies can minimise post-harvest losses and ensure better supply chain management, leading to improved food security. This significantly reduces food waste and increases food availability.
- **Resilience and Risk Management:** Climate-smart technologies like drought-resistant crop varieties and early warning systems can help farmers adapt to climate change and manage risks like natural disasters more effectively. This enhances farm resilience and protects against potential losses.

Challenges of Technology Missions

- **Digital Divide and Skill Gap:** Limited access to digital infrastructure and lack of technical skills among farmers can hinder the adoption and utilisation of technology effectively. This creates a barrier to entry and limits the reach of technology missions.
- **High Initial Costs and Infrastructure Needs:** Investment in technology, equipment, and infrastructure can be high, posing financial constraints for smallholder farmers. This necessitates innovative financing models and targeted support systems to ensure inclusivity.
- **Data Privacy and Security Concerns:** Sharing agricultural data raises concerns about privacy and security, requiring robust data governance frameworks to build trust and encourage participation. Addressing these concerns is crucial for widespread adoption.
- **Equity and Inclusivity:** Unequal access to resources and technology can exacerbate existing inequalities, necessitating targeted interventions and inclusive approaches to ensure benefits reach all farmers. Bridge the gap and promote equitable distribution of technological benefits.
- **Ethical Considerations and Potential Risks:** Uncontrolled use of certain technologies, like genetically modified crops, requires careful consideration of ethical implications and potential environmental risks. Implementing responsible innovation and robust regulations is essential.

Way Forward

- **Promoting Digital Literacy and Skill Development:** Investments in digital literacy programs and capacity building initiatives are crucial to bridge the digital divide and equip farmers with the skills needed to navigate technology. This empowers farmers and removes digital barriers.
- **Developing Affordable and Accessible Technologies:** Encouraging research and development of cost-effective technologies tailored to the needs of smallholder farmers can make them more accessible and widely adoptable. This ensures inclusivity and caters to the specific needs of small-scale agriculture.
- **Enhancing Infrastructure and Connectivity:** Expanding access to electricity, internet, and rural infrastructure is essential for enabling effective utilisation of technology in remote areas. This bridges the physical divide and promotes wider use of technological solutions.
- **Building Inclusive Frameworks and Partnerships:** Public-private partnerships, community-based approaches, and inclusive policy frameworks are crucial to ensure equitable access to technology and benefits for all stakeholders. This fosters collaboration and ensures everyone benefits from technological advancements.
- **Promoting Responsible Innovation and Ethical Practices:** Establishing clear ethical guidelines and regulations for developing and deploying agricultural technologies can address concerns about privacy, safety, and environmental impact. This ensures responsible innovation and protects environmental integrity.

IGNITE YOUR MIND

Do you think Technology Missions provide a viable roadmap for transforming Indian agriculture by leveraging modern technology, or are there inherent limitations that need to be addressed? How can these missions be tailored to better suit the diverse needs of farmers across different regions in India?

By tackling these challenges head-on and implementing the proposed solutions, technology missions in agriculture can unlock their full potential and pave the way for a more productive, sustainable, and equitable future for the agricultural sector.

THE SEED SECTOR IN INDIA

Seed is the basic and most critical input for sustainable agriculture. The response of all other inputs depends on the quality of seeds to a large extent. It is estimated that the direct contribution of quality seed alone to the total production is about 15–20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. The developments in the seed industry in India, particularly in the last 30 years, are very significant.

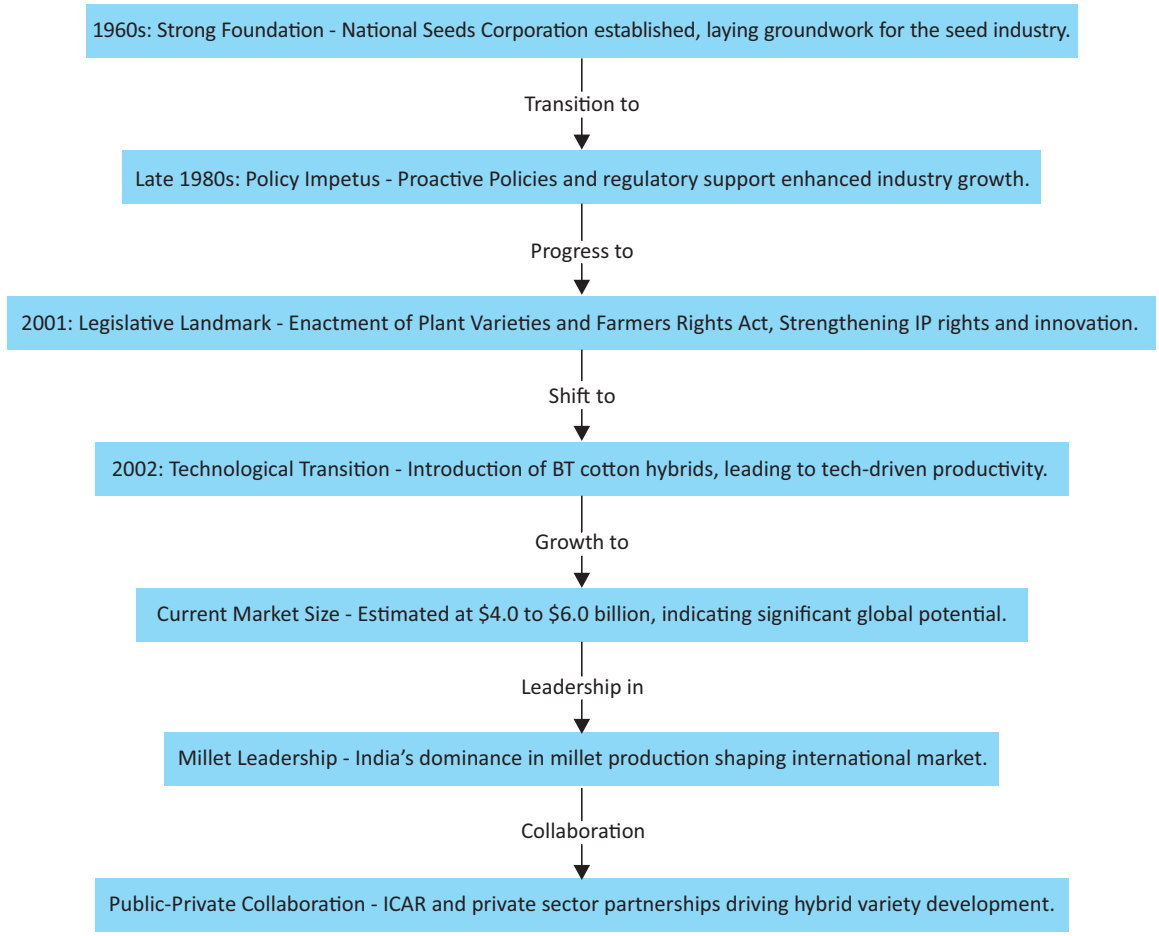

1960s: Strong Foundation - National Seeds Corporation established, laying groundwork for the seed industry.
Transition to
Late 1980s: Policy Impetus - Proactive Policies and regulatory support enhanced industry growth.
Progress to
2001: Legislative Landmark - Enactment of Plant Varieties and Farmers Rights Act, Strengthening IP rights and innovation.
Shift to
2002: Technological Transition - Introduction of BT cotton hybrids, leading to tech-driven productivity.
Growth to
Current Market Size - Estimated at $4.0 to $6.0 billion, indicating significant global potential.
Leadership in
Millet Leadership - India's dominance in millet production shaping international market.
Collaboration
Public-Private Collaboration - ICAR and private sector partnerships driving hybrid variety development.

Fig. 13.20: Growth of the Seed Sector

The Indian Seed Industry underwent significant transformation due to government interventions through the National Seed Project's three phases between 1977 and 1991. This restructuring marked a pivotal shift, creating a well-organised seed sector. The introduction of the New Seed Development Policy in 1988-1989 was another crucial milestone, opening up access for Indian farmers to high-quality seeds globally. This policy attracted investments from private entities and multinational corporations, leading to a robust R&D foundation in the seed industry. Today, the industry is diverse, offering a wide range of products, especially in high-value hybrids and advanced technologies like Bt. Cotton. The industry now adopts a farmer-centric approach and is driven by market demands. However, challenges remain, particularly for State Seed Corporations, which need to adapt their infrastructure, technologies, and management culture to stay competitive and contribute effectively to India's food and nutritional security goals.

National Seeds Policy, 2002: Thrust Areas

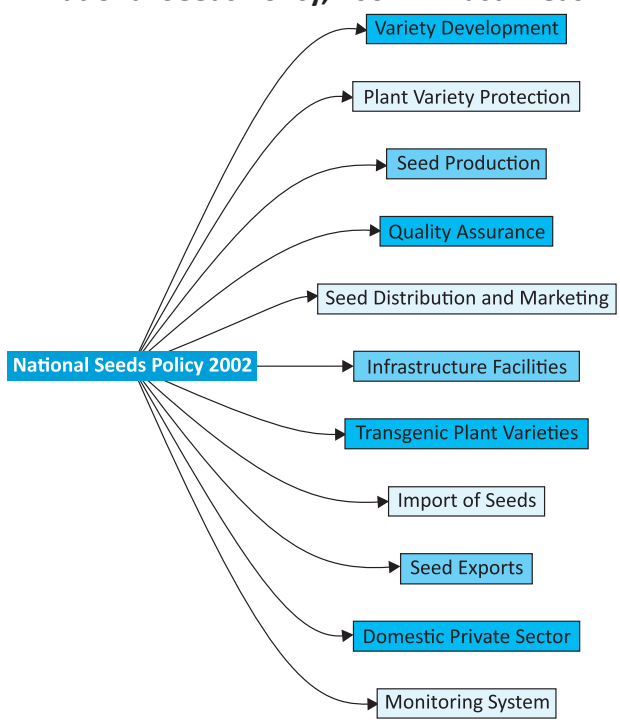


Fig. 13.21

Policy Initiatives in Seed Sector

The following policy initiatives have been taken by the Government of India in seed sector:

- Enactment of the Seeds Act, 1966
- Seed Review Team-SRT (1968)

- National Commission on Agriculture's Seed Group (1972)
- Launching of the World Bank aided National Seeds Programme (1975-85) in three phases leading to the creation of State Seeds Corporations, State Seed Certification Agencies, State Seed Testing Laboratories, Breeder Seed Programmes etc
- Seed Control Order (1983)
- Creation of the Technology Mission on Oilseeds & Pulses (TMOP) in 1986 now called The Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM).
- Production and Distribution Subsidy
- Distribution of Seed Mini-kits
- Seed Transport Subsidy Scheme (1987)
- New Policy on Seed Development (1988)
- Seed Bank Scheme (2000)
- National Seeds Policy (2002)
- The Seeds Bill (2004)
- Formulation of National Seed Plan (2005)
- National Food Security Mission (2007)
- Rashtriya Krishi Vikas Yojna (2007)

Seed Production System In India

The Indian seed programme largely adheres to the limited generations' system for seed multiplication in a phased manner. The system recognizes three generations namely **breeder, foundation and certified seeds** and provides adequate safeguards for quality assurance in the seed multiplication chain to maintain the purity of the variety as it flows from the breeder to the farmer.

Breeder Seed

Breeder seed is the progeny of nucleus seed and is produced by the originating breeder or by a sponsored breeder. Breeder seed production is the mandate of the Indian Council of Agricultural Research (ICAR) and is being undertaken with the help of;

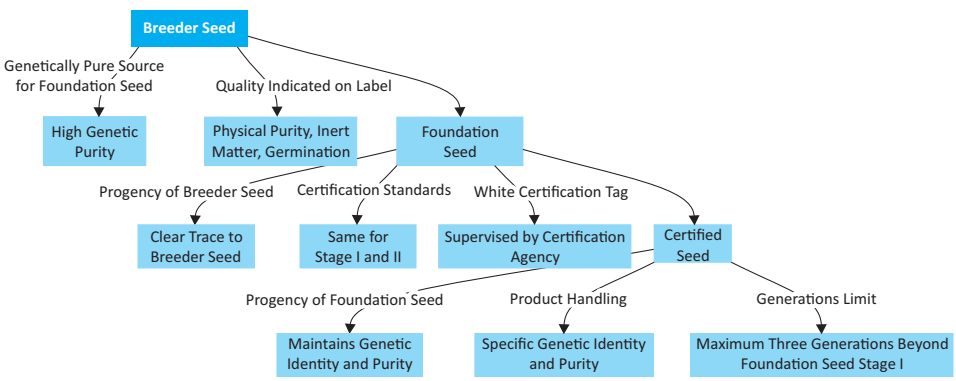


Fig. 13.22: Breeder Seed

- ICAR Research Institutions, National Research Centres and All India Coordinated Research Project of different crops;
- State Agricultural Universities (SAUs) with 14 centres established in different States;
- Sponsored breeders recognized by selected State Seed Corporations, and
- Non-Governmental Organisations.

Foundation Seed:

Foundation seed is the progeny of breeder seed and is required to be produced from breeder seed or from foundation seed which can be clearly traced to breeder seed. The responsibility for production of foundation seed has been entrusted to the NSC, SFCI, State Seeds Corporation, State Departments of Agriculture and private seed producers, who have the necessary infrastructure facilities. Foundation seed is required to meet the standards of seed certification prescribed in the Indian Minimum Seed Certification Standards, both at the field and laboratory testing.

Certified Seed:

Certified seed is the progeny of foundation seed and must meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, 1988.

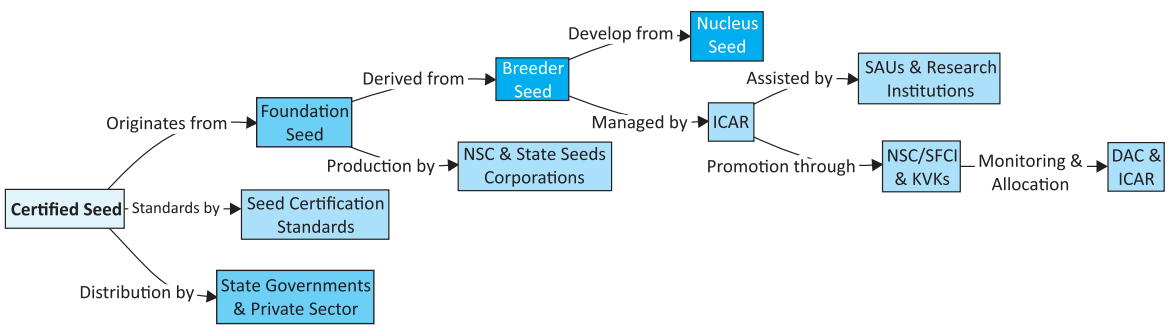


Fig. 13.23: Certified Seed

Role of Public & Private Seed Sector

The private sector has started to play a significant role in the seed industry over the last few years. However, the main focus of private seed companies has been on the high value low volume seeds and the market for low value high volume seeds of cereals, pulses and oilseeds is still dominated by the public sector seed corporations. Private sector companies have a significant place mainly in the case of maize and sunflower and cotton. However, in the case of vegetable seeds and planting materials of horticultural crops, the private sector is the dominant player. As the private sector has not been enthusiastic about entering into seed production of high volume low margin crops of wheat, paddy, other cereals, oilseeds and pulses, the public sector seed corporations will continue to remain dominant in cereals, pulses and oilseeds for many more years to come. At present 15 State Seeds Corporation and 2 National level seeds Corporations (National Seeds Corporation of India & State Farms Corporation of India) are functioning in the country. Besides, significant quantities of seeds are also produced by the State Departments of Agriculture, where the State Seeds corporations are not in existence.

Variety Registration Process

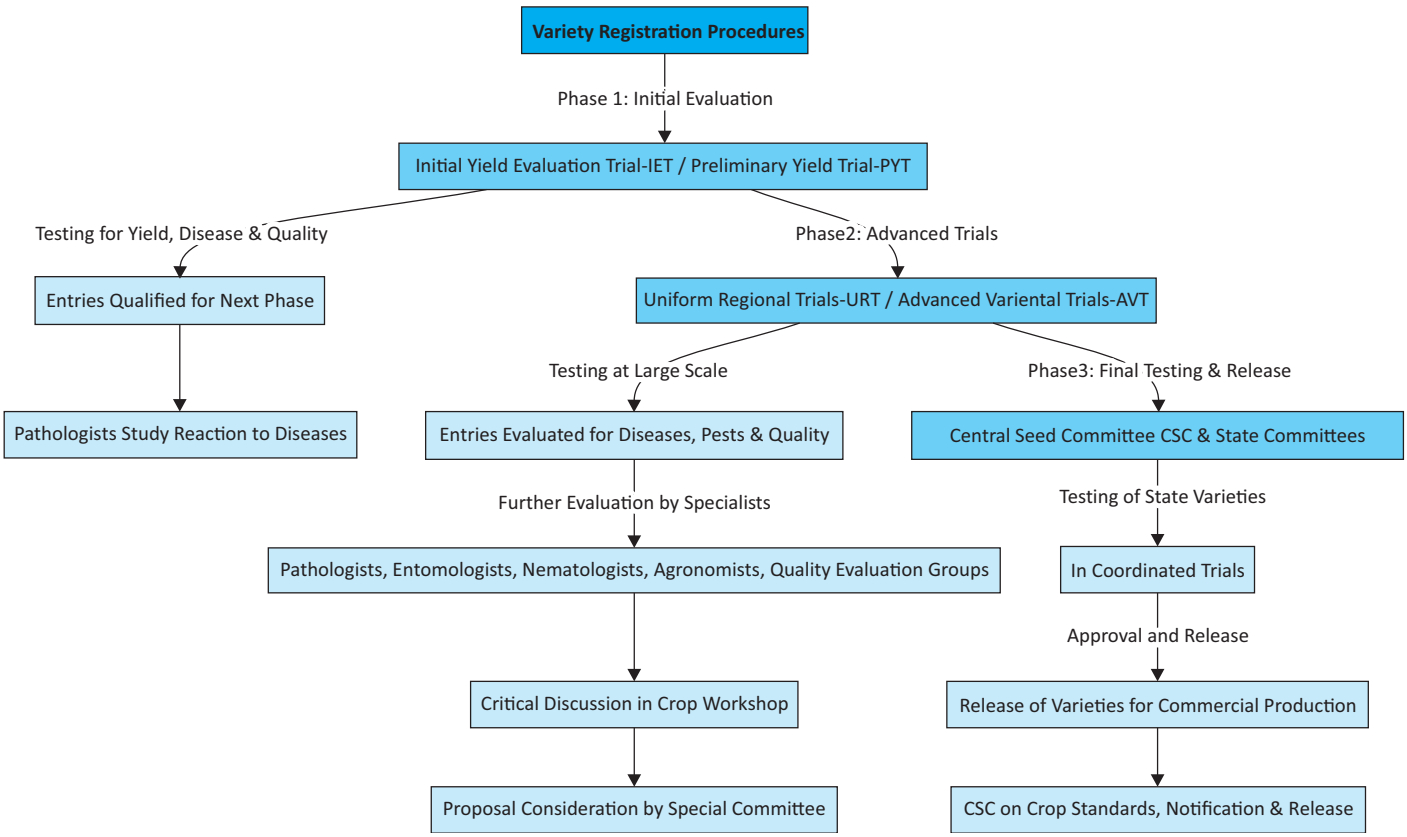

Variety Registration Procedures
Phase 1: Initial Evaluation
Initial Yield Evaluation Trial-IET / Preliminary Yield Trial-PYT
Testing for Yield, Disease & Quality
Phase2: Advanced Trials
Entries Qualified for Next Phase
Uniform Regional Trials-URT / Advanced Variental Trials-AVT
Testing at Large Scale
Phase3: Final Testing & Release
Pathologists Study Reaction to Diseases
Entries Evaluated for Diseases, Pests & Quality
Central Seed Committee CSC & State Committees
Further Evaluation by Specialists
Testing of State Varieties
Pathologists, Entomologists, Nematologists, Agronomists, Quality Evaluation Groups
In Coordinated Trials
Approval and Release
Critical Discussion in Crop Workshop
Release of Varieties for Commercial Production
Proposal Consideration by Special Committee
CSC on Crop Standards, Notification & Release

Fig. 13.24: Variety Registration Process

Varietal Protection in India

India is a signatory of the World Trade Organization (WTO). WTO has at least half a dozen intergovernmental agreements that directly affect agriculture. Under the TRIPS Agreement Article 27(3) (b), which deals with patentability or non patentability of plant and animal inventions and the protection of plant varieties resulted from the negotiations of the Uruguay Round, requires members to protect plant varieties either by patents or by an effective '*sui generis*' system of protection or by a combination of both these systems. In compliance with the TRIPS Agreement India established the Protection of Plant Varieties and Farmers Rights (PPV&FR) Authority, under the Protection of Plant Varieties and Farmers Rights Act, 2001. PPV & FR Authority has become operational since 11th November, 2005. The objectives of the Authority are:

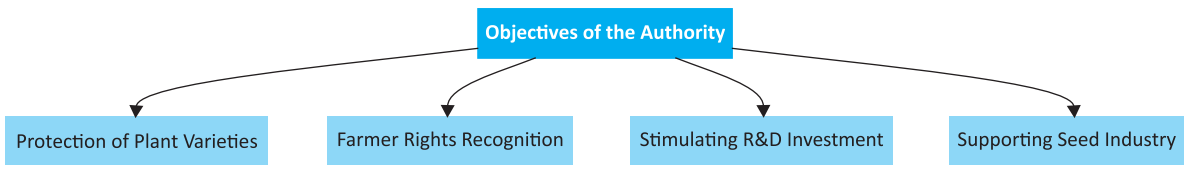


Fig. 13.25: PPV&FR Objectives

Any of the following persons can make an application to the PPV & FRA for registration of a variety:-

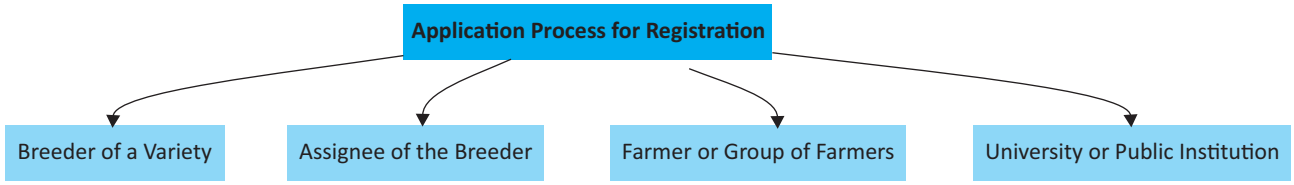

Application Process for Registration
Breeder of a Variety
Assignee of the Breeder
Farmer or Group of Farmers
University or Public Institution

Fig. 13.26: Application Process for Registration

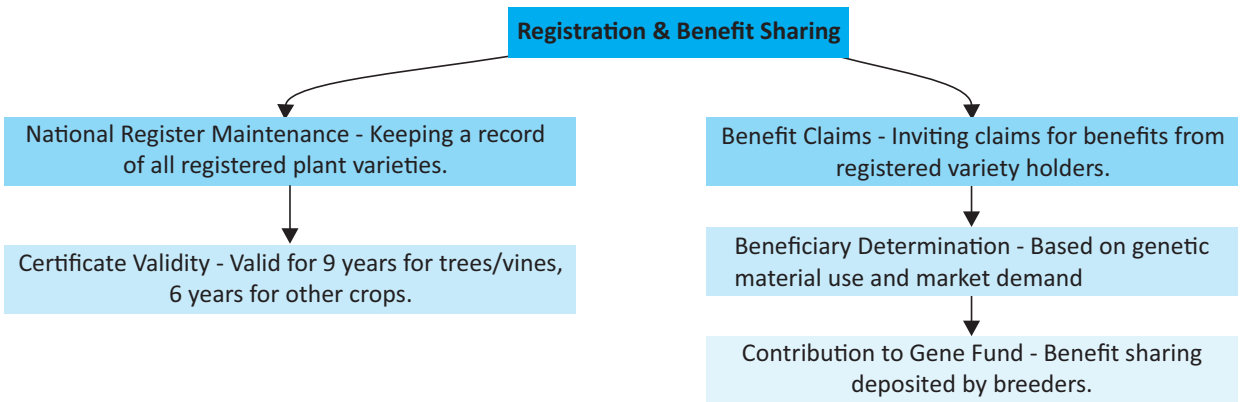

Registration & Benefit Sharing
National Register Maintenance - Keeping a record of all registered plant varieties.
Certificate Validity - Valid for 9 years for trees/vines, 6 years for other crops.
Benefit Claims - Inviting claims for benefits from registered variety holders.
Beneficiary Determination - Based on genetic material use and market demand
Contribution to Gene Fund - Benefit sharing deposited by breeders.

Fig. 13.27: Registration & Benefit Sharing

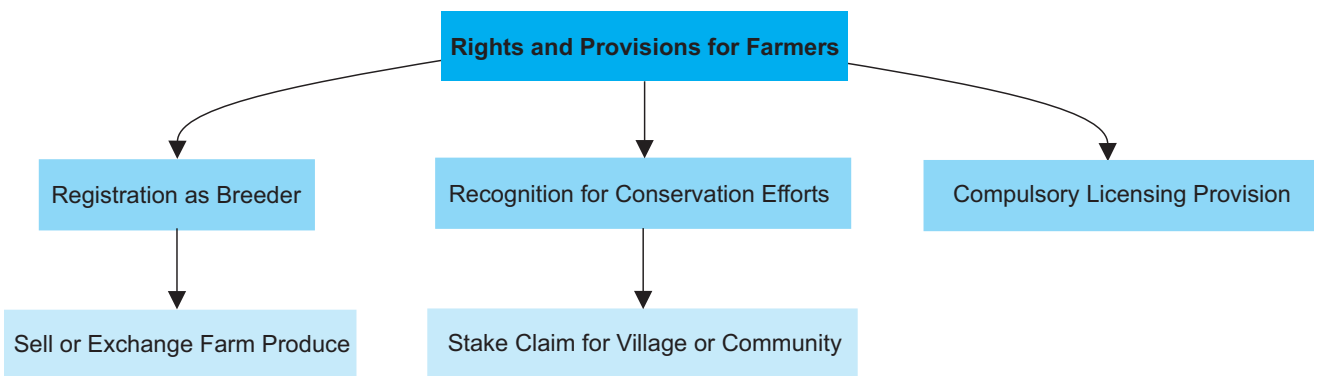

Rights and Provisions for Farmers
Registration as Breeder
Sell or Exchange Farm Produce
Recognition for Conservation Efforts
Stake Claim for Village or Community
Compulsory Licensing Provision

Fig. 13.28: Rights and Provisions for Farmers

There is a provision for compulsory licensing to meet the reasonable requirement of the public for seed or other propagating material.

Seed Certification System in India

In general, seed certification is a process designed to maintain and make available to the general public a continuous supply of high-quality seeds and propagating materials of notified kinds and varieties of crops, so grown and distributed to ensure the physical identity and genetic purity. Seed certification is a legally sanctioned system for quality control of seed multiplication and production.

Objective of Seed Certification

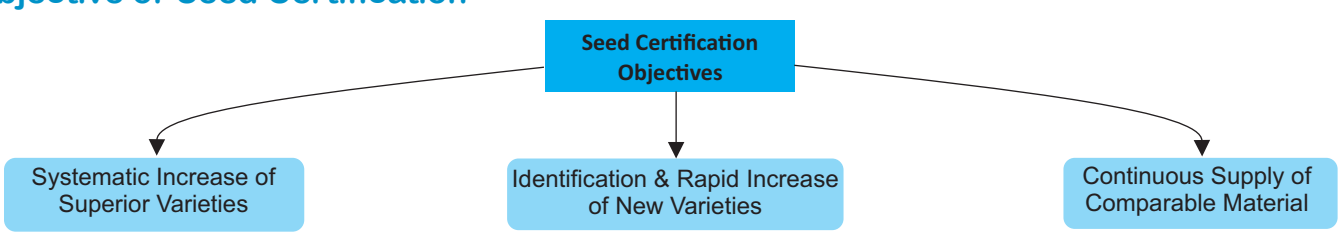

Seed Certification Objectives
Systematic Increase of Superior Varieties
Identification & Rapid Increase of New Varieties
Continuous Supply of Comparable Material

Fig. 13.29

Eligibility Requirements for Certification

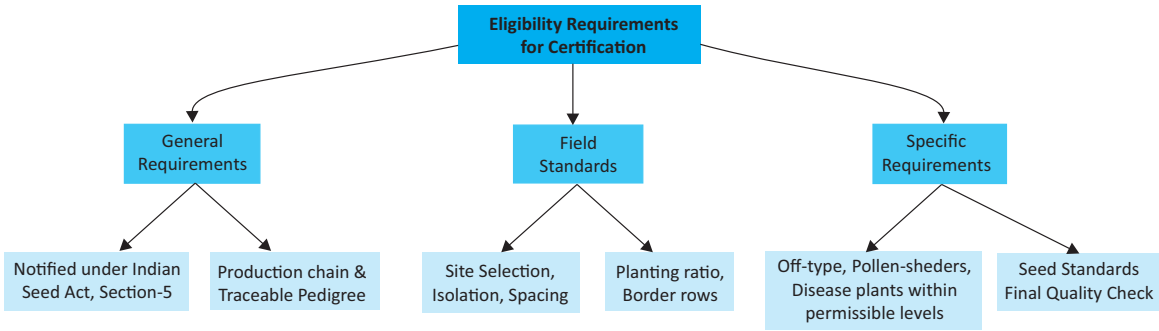

Eligibility Requirements for Certification
General Requirements
Field Standards
Specific Requirements
Notified under Indian Seed Act, Section-5
Production chain & Traceable Pedigree
Site Selection, Isolation, Spacing
Planting ratio, Border rows
Off-type, Pollen-sheders, Disease plants within permissible levels
Seed Standards Final Quality Check

Fig. 13.30

Seed Certification Agencies

Seeds Act, 1966 provides for the establishment of Seed Certification Agencies in each State.

Organisational set-up of a Seed Certification Agency

Organisation and establishment of a Seed Certification Agency needs careful planning. In planning one should take into consideration the pertinent data about anticipated acreage for certification of various crops/varieties, area of operation, farm sizes etc. The organisational set up of the Certification Agency includes Board of Directors, technical and other staff for operating the programme. Seed Certification Agency may have its own seed testing laboratory or it may get its seed samples tested through seed testing laboratories.

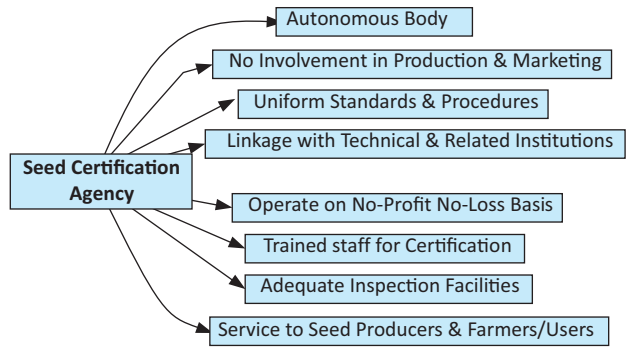

Seed Certification Agency
Autonomous Body
No Involvement in Production & Marketing
Uniform Standards & Procedures
Linkage with Technical & Related Institutions
Operate on No-Profit No-Loss Basis
Trained staff for Certification
Adequate Inspection Facilities
Service to Seed Producers & Farmers/Users

Fig. 13.31

Seed Certification Process in India

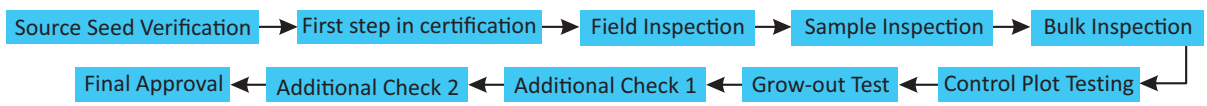


Fig. 13.32

Seed Export/Import

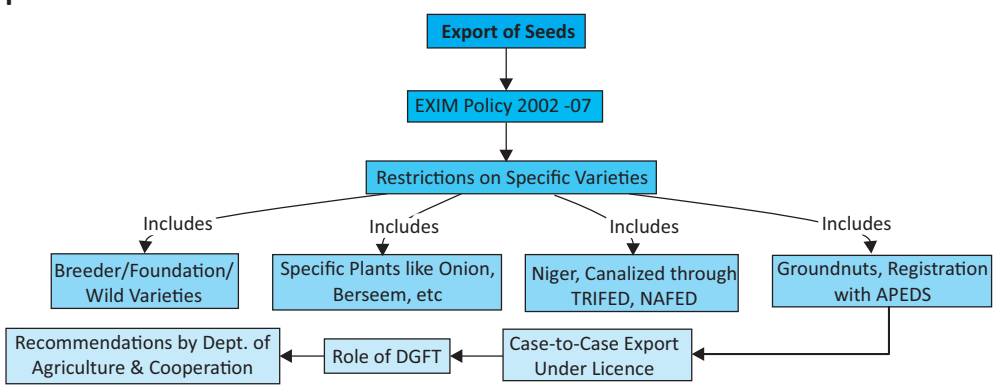


Fig. 13.33

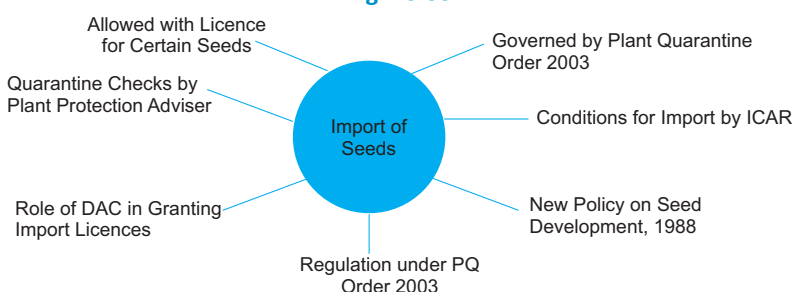

Import of Seeds
Allowed with Licence for Certain Seeds
Governed by Plant Quarantine Order 2003
Quarantine Checks by Plant Protection Adviser
Conditions for Import by ICAR
Role of DAC in Granting Import Licences
New Policy on Seed Development, 1988
Regulation under PQ Order 2003

Fig. 13.34

Certification Work under OECD Guidelines
EXIM Committee for Application
Designed Authorities for Certification
EXIM Committee & Global Trade
Monthly Meeting and Analysis
Participation in OECD Seed Schemes
Recommendations to PPA/DGFT
India's Position in World Seed Trade

Fig. 13.35

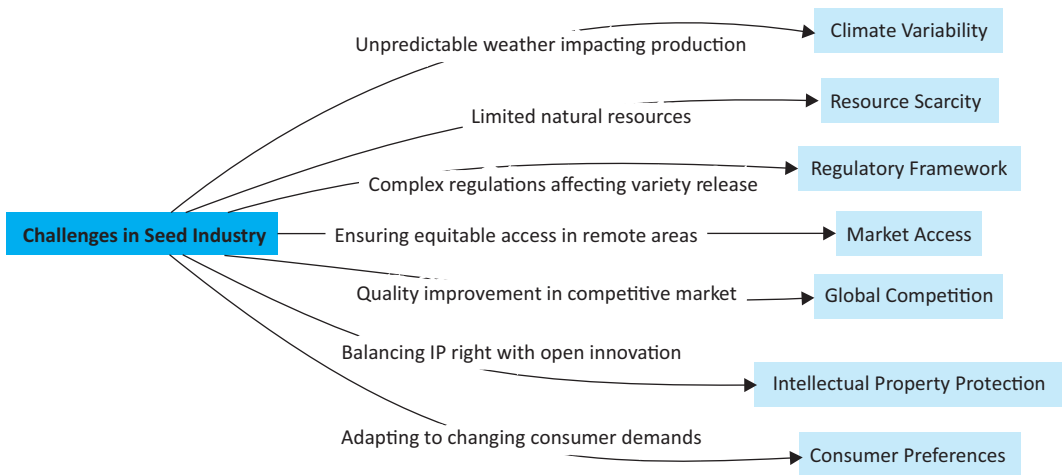


Fig. 13.36

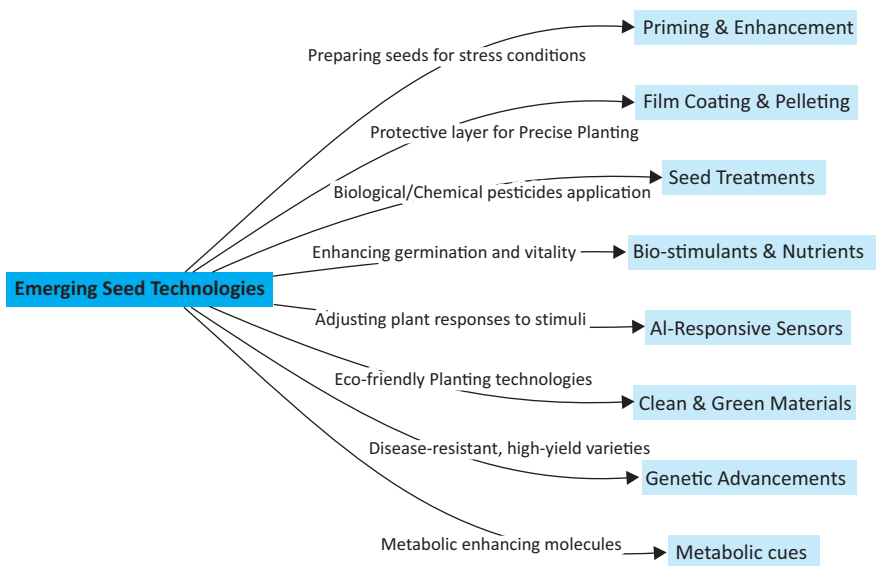


Fig. 13.37

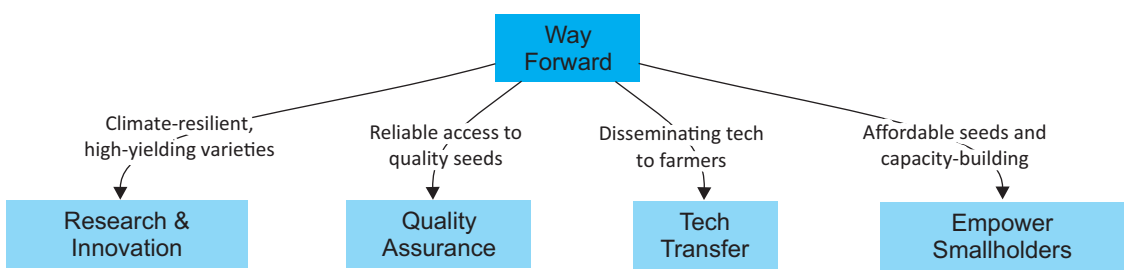


Fig. 13.38

IGNITE YOUR MIND

Do you think a balanced approach with collaboration between public and private sectors is crucial for ensuring food security and equitable access to quality seeds? Discuss potential strategies for such collaboration.

Genetically Modified Crops (GMOs)

Definition and Background

- **Genetically Modified Organism (GMO):** An organism with altered genetic material incorporating desirable traits.
- **Historical Applications:** Previously used in mass production of insulin, vaccines, etc.
- **Method:** Involves DNA manipulation, differing from traditional controlled pollination.

Common GM Crops and Traits

- **Widely Grown GM Crops:** Soybean, maize, cotton, canola known for herbicide tolerance and insect resistance.
- **Other Modified Traits:** Virus resistance, drought resistance, improved quality of fruits and tubers.

Process of Genetic Modification

- **Gene Identification and Isolation:** From a host organism.
- **Integration into Crop DNA:** For desired traits.
- **Testing:** Rigorous laboratory and field conditions to assess performance.

GM Crops in India

- **Bt Cotton:**
  - **Genetic Modification:** Bt cotton is genetically modified with two genes from the Bacillus thuringiensis bacterium. This modification enables the production of a protein toxic to the pink bollworm pest.
  - **Herbicide Resistance:** An additional gene from a different soil bacterium is inserted into Bt cotton to provide resistance against the commonly used herbicide glyphosate.
- **Bt Brinjal:**
  - **Pest Resistance:** A specific gene in Bt brinjal grants the plant immunity against attacks from fruit and shoot borers.
  - **Regulatory Status:** The commercial release of Bt brinjal in India has been suspended due to significant opposition from anti-GMO groups and non-governmental organisations.
- DMH-11 Mustard:
  - **Development and Traits:** Created by researchers at the University of Delhi, DMH-11 mustard has been genetically altered to enable cross-pollination, a deviation from its natural self-pollination process.
- **Global Variants:**
  - **International GM Crops:** Globally, genetically modified variants of crops like maize, canola, and soybean are cultivated.

Benefits of GM Products

- **Increased Crop Yields:** Enhanced productivity.
- **Cost Reduction:** In food and drug production.
- **Reduced Pesticide Need:** Due to inherent resistance.
- **Enhanced Nutrient Composition:** Improved food quality.
- **Pest and Disease Resistance:** Promoting agricultural resilience.
- **Food Security:** Addressing the needs of a growing population.
- **Animal Production:** Higher yield in milk and meat.
- **Extended Shelf Life:** Reducing spoilage rates.

Concerns of GM Crops

- **Health Risks:** Potential development of antibiotic-resistant diseases.
- **Ecological Imbalance:** Gene escape risks disrupting natural ecosystems.
- **Environmental Harm:** Potential negative impact on other organisms.
- **Permanence and Mutations:** Irreversible genetic changes and uncontrolled mutations.
- **Sustainability Issues:** Evolution of resistant pests and weeds.
- **Geopolitical Implications:** Dependency of developing countries on industrialised nations.
- **Religious and Cultural Opposition:** Perceived as unnatural food production.
- **Labelling and Awareness:** Lack of transparency in food labelling.

Regulatory Framework of Genetically Modified Crops in India

- **Regulatory Bodies and Approvals:**

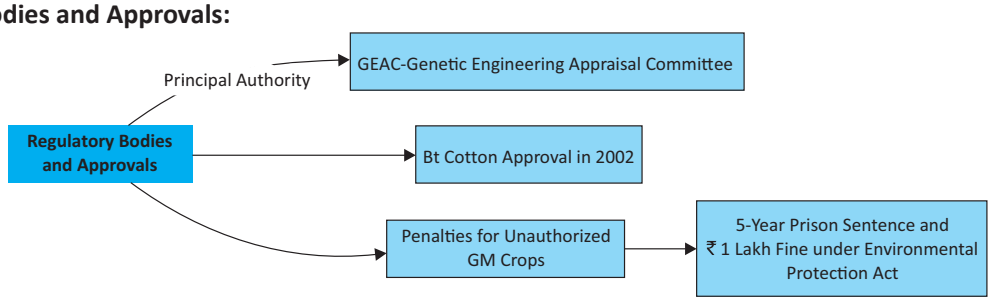

Regulatory Bodies and Approvals
Principal Authority
GEAC-Genetic Engineering Appraisal Committee
Bt Cotton Approval in 2002
Penalties for Unauthorized GM Crops
5-Year Prison Sentence and ₹ 1 Lakh Fine under Environmental Protection Act

Fig. 13.39

- **Regulatory Developments and Guidelines:**
  - **Genome-Edited Crops Exemption:** The Central Government recently exempted certain genome-edited crops from stringent GM crop regulations to encourage research and development.
  - **Ministry of Environment and Forests Order:** The order exempted SDN1 and SDN2 genome-edited plants from specific rules under the Environment Protection Act for handling hazardous organisms.
  - **DBT Guidelines:** The Department of Biotechnology issued guidelines to simplify research on GM crops, focusing on overcoming challenges related to the use of foreign genes.
  - **FSSAI Regulation:** On February 8, 2021, the Food Safety and Standards Authority of India set a 1% permissible limit for GMOs in imported food crops.
- **Legislative Measures and Policies:**

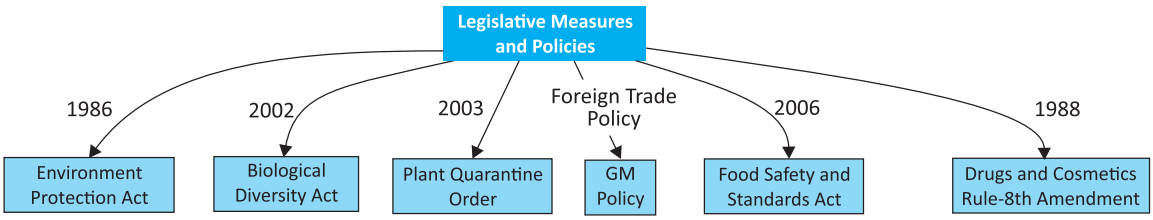


Fig. 13.40

- **Regulatory Scope:** Covers research, trials, release, import, export, and manufacture of GMOs.

IGNITE YOUR MIND

Bt cotton has been a success story in India, but fears of monoculture dependence and evolution of resistant pests raise concerns about long-term sustainability. Do you think India needs to diversify its GM crop portfolio and invest in alternative pest management strategies to ensure long-term agricultural resilience and protect ecological balance?

SOILS IN INDIA

Definition and Formation

- **Soil Composition:** A mix of small rock particles, organic materials, and humus.
- **Influencing Factors:** Parent material, relief/ topography, climate, natural vegetation, biological factors, and time.

Soil Classification in India

- **Initial Classification:** Vasily Dokuchaev was the first to classify soil scientifically.
- **ICAR Classification:** The Indian Council of Agricultural Research categorises Indian soils into 8 types based on colour and resource significance.

Major Soil Types in India (ICAR Classification)

- Alluvial Soil
- Black Cotton Soil
- Red Soil
- Laterite Soil
- Mountainous or Forest Soils
- Arid or Desert Soil
- Saline and Alkaline Soil
- Peaty, and Marshy Soil/Bog Soil

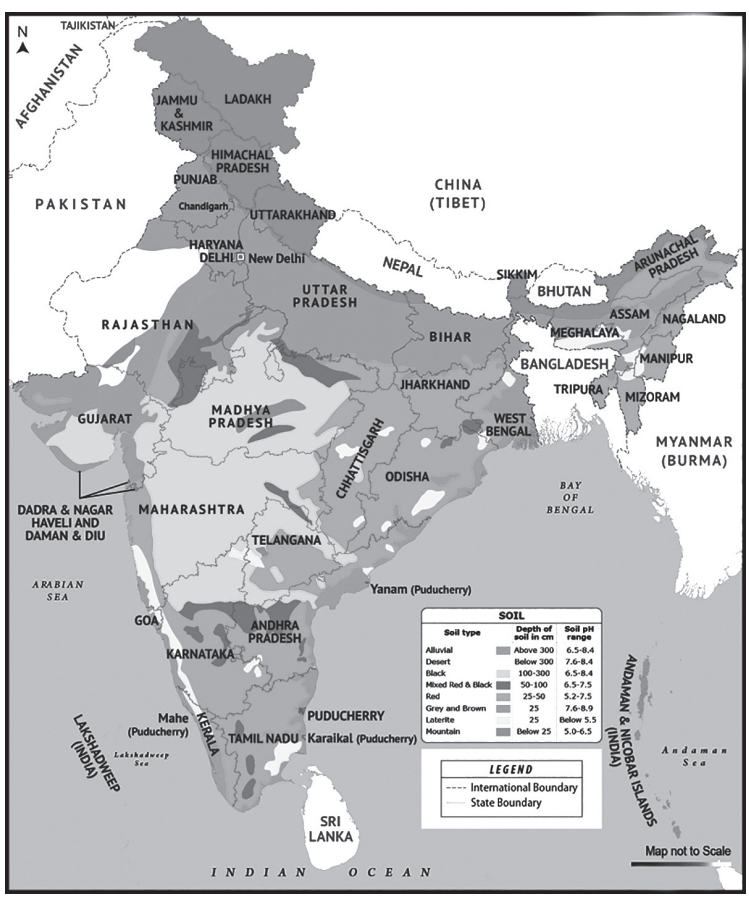


Fig. 13.41: Major Soil Types in India

Specific Soil Types and Their Characteristics:

Type of Soil	Formation	Parent Material	Distribution	Characteristics	Chemical Properties	Agricultural Suitability
Alluvial Soils	Silt deposited by Indo-Gangetic-Brahma putra rivers and coastal wave action	Rocks of the Himalayas, transported origin	Indo-Gangetic-Brahmaputra plains, deltas, Narmada, Tapi valleys, Northern Gujarat	Immature profiles, sandy to clayey texture, good drainage, replenished by floods	Low nitrogen, adequate potash, phosphoric acid, alkalies, variable iron oxide and lime	Highly productive for rice, wheat, sugarcane, vegetables
Black Soils	Weathered basaltic rocks of the Deccan Plateau	Basaltic rocks of Deccan Plateau	Maharashtra, Madhya Pradesh, parts of Karnataka, Telangana	High clay content, moisture retentive cracks in dry conditions	Rich in calcium carbonate, magnesium, potash, and lime; low in phosphorus	Ideal for cotton, also wheat, jowar, linseed
Red Soils	On Archean granite, characterised by ferric oxides	Granite and gneiss rocks	Peninsula from Tamil Nadu to Bundelkhand, Raj Mahal to Kathiawad	Sandy to loamy texture, variable rainfall adaptability	Rich in iron and potassium, deficient in nitrogen, phosphorus, and humus	Supports rice, sugarcane, cotton, millets with irrigation and humus
Laterite Soils	In regions with laterite rock structure, dry-wet periods	Laterite rocks	Western Ghats, Eastern Ghats, Amarkantak plateau	Brown, rich in iron and aluminium, moderate humus content	High in iron oxide and aluminium, low in nitrogen, potassium, lime, and magnesium	Suitable for groundnut, cashew nut, coffee, rubber
Mountainous/ Forest Soils	In mountainous regions with steep slopes	Organic matter from forest vegetation	Himalayas, Western Ghats, Nilgiri, Annamalai, Cardamom hills	Thin-layered, erosion-prone, rich in organic content but nutrient-deficient	Rich in organic matter and humus, low in nitrogen and phosphorus	Tea, coffee, rubber plantations, bamboo
Arid/Desert Soil	In arid and semi-arid areas, wind-deposited	Sandy materials	Rajasthan, parts of Haryana, Punjab, Gujarat	Sandy, low in humus and nitrogen, rich in iron	Low in organic matter, high in soluble salts, phosphorus and calcium	Less water-intensive crops like Bajra and pulses
Saline and Alkaline Soil		Saline deposits	Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar, Maharashtra	High NaCl content, generally infertile	High in sodium, chloride, and other soluble salts	Suitable for leguminous crops
Peaty and Marshy Soil	In areas with inadequate drainage, high organic matter	Organic matter and decomposed plant material	Delta regions, Alleppey (Kerala), Almora (Uttaranchal)	Clay and mud dominance, high moisture and salt content	Rich in organic matter and nitrogen, acidic in nature	Jute, rice, spices, rubber in specific regions

Soil Health Card Scheme

- **Initiative:** Launched by the Department of Agriculture & Cooperation, Ministry of Agriculture and Farmers' Welfare.
- **Implementation:** Across all States and Union Territories.
- **Objectives and Features:**
  - **Goal:** To assess soil nutrient status and guide farmers on fertiliser usage and soil amendments.
  - **Soil Health Card:** A report detailing the soil status across 12 parameters like pH, nutrients, and electrical conductivity.
  - **Frequency:** Farmers receive the card once every three years, with soil sampling twice annually after Rabi and Kharif harvests.
  - **Involvement:** Utilises local youth, Women Self Help Groups, FPOs for soil testing.

- Benefits of the Scheme
  - **Soil Monitoring:** Regular updates on soil health every three years.
  - **Expert Assistance:** Guidance from experts in enhancing soil quality.
  - **Informed Decision Making:** Helps farmers choose suitable crops and fertilisers.
  - **Increased Yield:** Aims to boost crop productivity through better soil management.
  - **Employment Opportunities:** Creates jobs for youth in agriculture.
- Challenges and Concerns
  - **Infrastructure Deficit:** Lack of adequate soil testing facilities.
  - **Limited Parameters:** Overemphasis on chemical nutrients; lack of physical and biological indicators like moisture retention.
  - **Farmer Engagement:** Issues with farmer understanding and connectivity with agricultural officers.
  - **Sampling Limitations:** Inadequate representation of soil variability.
- Need for Soil Health Card Scheme
  - **Dependence on Fertilisers:** Increasing reliance leading to negative soil impacts.
  - **Nutrient Deficiency:** Significant deficiencies in essential nutrients (N, P, K, S, Zn, B, Fe, Mn, Cu).
  - **Lack of Knowledge:** Farmers unaware of optimal crop choices and soil quality.
  - **Soil Quality Impact:** Lower fertiliser response and crop productivity due to nutrient-poor soil.
- Future Directions for the Scheme
  - **Awareness Campaigns:** Essential before sowing season for effective utilisation of soil health recommendations.
  - **Monitoring Bodies:** Need for specialised agencies at state and central levels for overseeing scheme implementation.
  - **Experimental Demonstrations:** Conducting trials in each block to showcase the scheme's efficacy

AGRICULTURAL LABOUR IN INDIA

Evolution of Agricultural Labor

- **Origin:** Rooted in the 19th, 20th century in the culture of cash cropping introduced by the British. The Five Year Plans had their objective to uplift rural communities, particularly agricultural labourers and backward classes.
- **Growth Trend:** The National Sample Survey Organisation (NSSO) has been conducting nationwide sample surveys on various socio-economic aspects since 1950. A significant shift was noted in the National Sample Survey reports, indicating a rise in agricultural labourers due to limited industrial growth.
- **Underlying Issues:** There have been underemployment and surplus labour, especially in sectors like agriculture, reflecting a complex scenario of rural employment.
- **Current State:** The Census of India data points to agricultural workers as among the lowest earners, with many lacking land ownership or vocational skills for alternative employment. As per Census 2011, the total number of agricultural workers in the country has increased from 234.1 million in 2001 to 263.1 million in 2011. However, the share of the workforce engaged in the agriculture sector (comprising cultivators and agricultural labourers) has come down from 58.2 per cent in 2001 to 54.6 per cent in 2011.

Labour Policy and Agricultural Workforce in India

- **Policy Evolution:**
  - **Adaptive Nature:** Labor policies, as documented in the Five Year Plans and various labour laws, have continually evolved to align with the country's socio-economic objectives.
- **Agricultural Labour Enquiry Committees:**
  - **First Committee (1950-51):** The committee's definition of agricultural workers was based on wage data and employment duration.
  - **Second Committee (1956-57):** This broader definition encompassed a wider range of rural occupations, reflecting the diversification of rural livelihoods.

Classification of Agricultural Workers

The first committee again classified the agricultural workers into two different categories such as:

- Attached labourers are those workers who are attached to some other farmer households on the basis of a written or oral agreement.
- Landless labourers who exclusively work for others.
- Tenants who work on leased land but work most of the time on the land of others;
- Sharecroppers who also work as agricultural labourers.

Challenges Facing Agricultural Labourers

- **Persistent Unorganization:** The lack of organisation among agricultural labourers, as highlighted in various labour studies, continues to undermine their bargaining power.
- **Low Income Levels:** Income surveys show that the wages of agricultural labourers remain among the lowest, contributing to rural poverty.
- **Employment Issues:** Seasonal unemployment and underemployment are chronic issues in agriculture, as shown in employment data from the Ministry of Labour.

- **Social Disempowerment and Indebtedness:** Socially marginalised groups, often represented among agricultural labourers, face added challenges of indebtedness and lack of empowerment, as reported in various social studies.

Government Measures for Agricultural Laborers

- **Legislative Measures:** Acts like the Bonded Labour System (Abolition) Act, 1976, and the Minimum Wages Act, 1948, are crucial steps in improving labour conditions, though implementation varies across states.
- **Land Redistribution:** The ceiling laws and land redistribution programs aimed at reducing landlessness have had mixed success, with issues in the quality of land distributed, as per government reports.
- **Housing and Employment Schemes:** Schemes like the MGNREGA and PM Awaas Yojana(PMAY) have aimed at providing alternate employment and improving living conditions, though their effectiveness varies regionally.
- **Special Agencies and Plans**
  - **Development Agencies:** The Small Farmer Development Agency and Marginal Farmer and Agricultural Labourers Development Agency were set up during the Fourth Plan, reflecting a targeted approach towards small farmer and labourer development, though their impact has been limited by various challenges.

Recommendations for Agricultural Labor Improvement

- **Implementing Minimum Wage Act:** Serious implementation of this Act is essential, as noted in various labour studies.
- **Creating Alternative Employment:** Developing rural industries as suggested in the Five Year Plans can provide non-agricultural employment opportunities.
- **Improving Agricultural Conditions:** Adoption of modern farming techniques, as suggested in agricultural policy reports, can enhance productivity and labour conditions.
- **Social Security Measures:** As per recommendations in economic surveys, introducing insurance and pension schemes for agricultural workers can provide much-needed social security.

IRRIGATION IN INDIA

Types of Irrigation

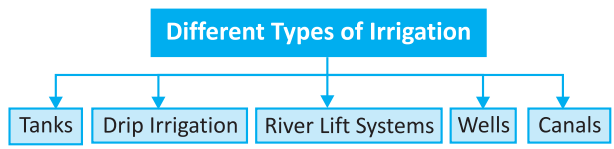


Fig. 13.42

Well and Tube Well Irrigation

- Wells are mainly found in Punjab, Bihar, Tamil Nadu, etc.
- There are various types of wells – shallow wells, deep wells, tube wells, artesian wells, etc. From the shallow wells water is not always available as the level of water goes down during the dry months.
- Deep wells are more suitable for the purpose of irrigation as water from them is available throughout the year.
- At places where groundwater is available, a tube well can be installed near the agricultural area. A deep tube well worked by electricity, can irrigate a much larger area than a surface well.
- Tube wells are mostly used in Punjab, Haryana, Punjab, Bihar and Gujarat.

Merits	Demerits
Well is the simplest, cheapest and independent source of irrigation and can be used as and when the necessity arises.	Only a limited area can be irrigated. In the event of a drought, the ground water level falls and enough water is not available.
Several chemicals such as nitrate, chloride, sulphate, etc. found in well water add to the fertility of soil.	Tube wells can draw a lot of groundwater from its neighbouring areas and make the ground dry and unfit for agriculture.
More reliable during periods of drought when surface water dries up.	Wastage of water due to subsidised electricity in green revolution region

Canal Irrigation:

- Canals can be an effective source of irrigation in areas of low-level relief, deep fertile soils, perennial source of water and extensive command area.
- Therefore, the main concentration of canal irrigation is in the northern plain of India, especially the areas comprising Uttar Pradesh, Haryana and Punjab.
- The digging of canals in rocky and uneven areas is difficult and uneconomic. Thus, canals are practically absent from the Peninsular plateau area. However, the coastal and the delta regions in South India do have some canals for irrigation.

Merits	Demerits
Most of the canals provide perennial irrigation and supply water as and when needed.	Many canals overflow during the rainy season and flood the surrounding areas.
This saves the crops from drought conditions and helps in increasing the farm production.	Canal irrigation is suitable in plain areas only.
This sediment is deposited in the agricultural fields which make soil more fertile.	The canal water soaks into the ground and results in water-logging along the canal route.
Initial cost involved in canal irrigation is more, it is quite cheap in the long run.	Excessive flow of water in the fields raises the ground water level.
Unirrigated wastelands can be developed by canal irrigation, which would increase the quantity of biomass in the area.	Capillary action brings alkaline salts to the surface and makes large areas unfit for agriculture

- **Two types:** Inundation canals, which are taken out from the rivers without any regulating system like weirs etc. at their head. Such canals provide irrigation mainly in the rainy season when the river is in flood and there is excess water.
- Perennial Canals are those which are taken off from perennial rivers by constructing a barrage across the river. Most of the canals in India are perennial.

Tanks Irrigation

- A tank is developed by constructing a small bund of earth or stones built across a stream. The water impounded by the bund is used for irrigation and other purposes. Tank comprises an important source of irrigation in the Karnataka Plateau, MP, Maharashtra, Odisha, Kerala Bundelkhand area of MP, Rajasthan and Gujarat.

Merits	Demerits
Most of the tanks are natural and do not involve heavy cost for their construction	Many tanks dry up during the dry season and fail to provide irrigation when it is required.
Tanks have a longer life span.	Much water is evaporated from the large expanse of shallow water and is therefore not available for irrigation.
In many tanks, fishing is also carried on, which supplements both the food resources and income of the farmer	Lifting water from tanks and carrying it to the fields is a strenuous and costly exercise.

Drip Irrigation

- In drip irrigation, water is applied near the plant root through emitters or drippers, on or below the soil surface, at a low rate varying from 2-20 litres per hour. The soil moisture is kept at an optimum level with frequent irrigation.
- Among all irrigation methods, drip irrigation is the most efficient and can be practised for a large variety of crops, especially in vegetables, orchard crops, flowers and plantation crops.

Merits	Demerits
Fertiliser and nutrient loss is minimised due to localised application and reduced leaching.	Initial cost can be more.
Field levelling is not necessary. Recycled non-potable water can be used.	Can result in clogging, wastage of water, time and harvest, if not installed properly.
Water application efficiency increases.	Lack of skilled labour.
Soil erosion and weed growth is lessened.	Maintenance is costly

Sprinkler Irrigation

- In this method, water is sprayed into the air and allowed to fall on the ground surface somewhat resembling rainfall. The spray is developed by the flow of water under pressure through small orifices or nozzles.
- The sprinkler irrigation system is a very suitable method for irrigation on uneven lands and on shallow soils.
- Nearly all crops are suitable for sprinkler irrigation systems except crops like paddy, jute, etc.
- The dry crops, vegetables, flowering crops, orchards, plantation crops like tea, coffee are all suitable and can be irrigated through sprinklers.

Merits	Demerits
Suitable to all types of soil except heavy clay	Lack of skilled labour to manage it
Water saving to 30%-50%	Higher initial cost.
Increase in yield	Under high wind conditions and high temperature distribution and application efficiency is poor.
Saves land as no bunds etc. are required.	Reduces productivity of soil in long term

Trends Over Irrigation Patterns in India

In India, groundwater has become the dominant source of Irrigation. On the other hand, there is a large gap between the ultimate and utilised surface water potential. With continual diminishing per capita water availability coupled with groundwater exploitation, it has become imperative to switch to efficient water saving technologies and alternative sources of irrigation like canal water, rainwater harvesting. Rapid depletion of water table, low irrigation efficiency, and frequent droughts indicate a water crisis in near future if existing water use pattern is not rectified. Irrigation infrastructure needs to be further improved to harvest rainwater and increase storage capacity in order to utilise runoff water. Micro irrigation has scope for improving irrigation efficiency up to 90 per cent. Further, micro irrigation and optimum crop plan will play decisive roles in conservation of water resources and food security of the nation. Virtual water trade should be balanced instead of orienting it towards export. Farmers should be made aware of the various government schemes to utilise their utmost potential which is lacking in some states.

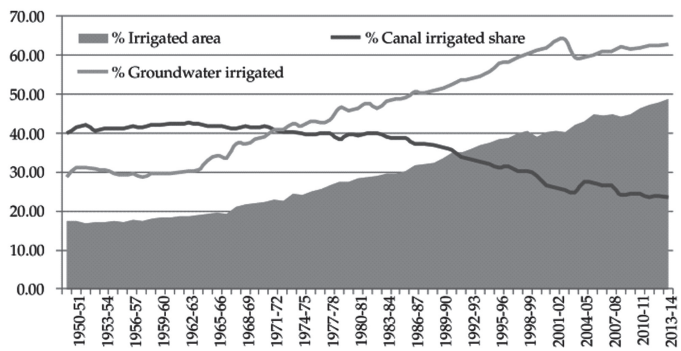
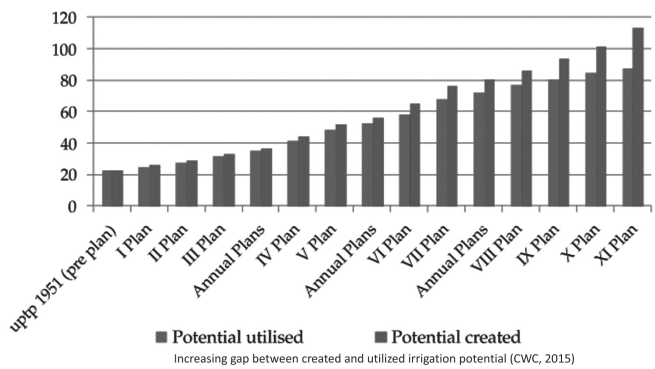


Fig. 13.43



Increasing gap between created and utilized irrigation potential (CWC, 2015)

Fig. 13.44

Fertigation

- Fertigation is a method of fertiliser application in which fertiliser is incorporated within the irrigation water by the drip system.
- In this system fertiliser solution is distributed evenly in irrigation. The availability of nutrients is very high therefore the efficiency is more.
- In this method liquid fertiliser as well as water soluble fertilisers are used. By this method, fertiliser use efficiency is increased from 80 to 90 per cent.

Advantages of Fertigation

- Nutrients and water are supplied near the active root zone through fertigation which results in greater absorption by the crops.
- As water and fertiliser are supplied evenly to all the crops through fertigation there is possibility for getting 25-50 per cent higher yield.
- Fertiliser use efficiency through fertigation ranges between 80-90 per cent, which helps to save a minimum of 25 percent of nutrients.
- By this way, along with less amount of water and saving of fertiliser, time, labour and energy use is also reduced substantially.

Pradhan Mantri Krishi Sinchai Yojana (PMKSY)

PMKSY Envisages Amalgamation of

1. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR RD & GR)
2. Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR)
3. On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC)

Objectives

- Achieve convergence of investments in irrigation at the field level
- Har Khet ko pani – Expand cultivable area under assured irrigation
- More crop per drop – Improve on-farm water use efficiency to reduce wastage of water & enhance the adoption of precision-irrigation and other water saving technologies
- Enhance recharge of aquifers and introduce sustainable water conservation practices by exploring the feasibility

of reusing treated municipal based water for peri-urban agriculture
- Attract greater private investment in precision irrigation systems.

Salient Features

- Decentralised State level planning and projected execution structure in order to allow States to draw up a District Irrigation Plan (DIP) and a State Irrigation Plan (SIP). These plans need to be prepared in order to access the PMKSY fund.
- It will be supervised and monitored by the Inter-Ministerial National Steering Committee (NSC) under PM with Union Ministers of all concerned Ministries. A National Executive Committee (NEC) is to be constituted under the Chairmanship of the Vice Chairman, NITI Aayog to oversee programme implementation.
- PMKSY has been formulated amalgamating ongoing schemes Accelerated Irrigation Benefit Programme (AIBP); Integrated Watershed Management Programme (IWMP); and On Farm Water Management (OFWM) component of National Mission on Sustainable Agriculture (NMSA).
- Water budgeting is done for all sectors namely, household, agriculture and industries.
- Investments will happen at farm level. So, farmers know what is happening and can provide valuable feedback.
- Recently, Long Term Irrigation Fund has been instituted under PMKSY in NABARD for funding and fast tracking the implementation of incomplete major and medium irrigation projects.

National Watershed Project

- Watershed project involves conservation, regeneration and judicious use of all the resources like land, water, plants, animals and humans within the watershed area.
- The National Watershed Project also known as Neeranchal. The National Watershed Project is a World Bank assisted watershed management project.
- The objective of this project is to support Integrated Watershed Management Program (IWMP) through technical assistance to improve incremental conservation outcomes for the natural resources including water, soil and forests while enhancing agricultural yields in a sustainable manner for farming communities.

IGNITE YOUR MIND

Do you think there is a need for greater emphasis on community-based approaches in watershed management projects like Neeranchal? How can the involvement of local communities contribute to the success and sustainability of watershed initiatives, especially in water-stressed regions?

- Water-stressed regions of India such as Northwest India, Vidarbha region of Maharashtra etc. are prone to drought and water scarcity thus affecting the agricultural production in the regions. The National Watershed Project has the potential in increasing agricultural production in these regions.

UNDERSTANDING FERTILIZER SECTOR IN INDIA

Fertilisers are substances, either organic or inorganic, natural or artificial, that supply essential nutrients for plant growth. They provide six primary macronutrients and eight secondary micronutrients for balanced plant development.

General Overview of Fertilisers

Nutrient Composition in Fertilisers

- **Primary (Macro) Nutrients:** Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sulphur (S).
- **Secondary (Micro) Nutrients:** Boron (B), Chlorine (Cl), Copper (Cu), Iron (Fe), Zinc (Zn), etc.

Types of Fertilisers

- **Nitrogenous:** Main component is Nitrogen (N). Examples: Urea, Ammonium Nitrate, Ammonium Sulphate.
- **Potassic:** Examples include Potassium Nitrate, Chile Saltpetre.
- **Phosphatic:** Examples: Super Phosphate, Triple Phosphate.
- **Neem Coated Urea:** Urea sprayed with neem oil for agronomic and environmental benefits.

Advantages of Neem Coated Urea

- Slows down nitrogen release from urea, enhancing Nitrogen Use Efficiency (NUE).
- Reduces fertiliser consumption, saves money, and improves soil health.
- Decreases pest and disease attacks, reducing the need for plant protection chemicals.

Indian Fertilizer Sector Overview

- Indian soils are generally deficient in N, P, and K, necessitating fertiliser use.
- **Key players:** National Fertilisers Limited, Rashtriya Chemicals & Fertilisers Limited (PSUs), IFFCO, KRIBHCO (Co-operatives).
- India ranks 3rd in production and 2nd in consumption of fertilisers globally.
- **Decision-making body:** Department of Fertilisers, Ministry of Chemicals & Fertilisers, Government of India.

Fertilizer Policy and Constitutional Provisions in India

- Fertiliser industry regulated by the Union Government under IDR Act, 1951.

- **Urea:** Most produced, consumed, and imported fertiliser.
- India produces 80% of its urea needs but depends heavily on imports for raw materials of phosphatic and potassium fertilisers.

Governmental Interventions in Fertilizer Policy

- **Objectives:** Focus on primary nutrients and regulate sale, price, and quality of fertilisers.
- **Historical perspective:** No fertiliser subsidy until 1977, except a brief subsidy on Potash in 1977.
- **Retention Pricing Scheme (RPS):** Introduced in 1977 for nitrogenous fertilisers and later extended to phosphatic and potassic fertilisers.

Effects and Changes in Fertilizer Policy

- Increase in domestic fertiliser production and consumption but led to fiscal deficit issues.
- Partial decontrol of phosphatic and potassic fertilisers in 1992, leading to imbalances in fertiliser consumption.
- **New Pricing Scheme (NPS):** Introduced in 2003 for urea, based on feedstock prices and plant vintage.

Nutrient-Based Subsidy (NBS) Policy, 2010

- Subsidy based on the weight of different nutrients in fertilisers.
- Manufacturers/marketers can set MRP at reasonable levels.
- Aimed at balanced fertiliser use, agricultural productivity, and reducing subsidy burden.

Neem Coated Urea Policy, 2015

- Mandatory neem coating for at least 75% of domestic urea production.
- Aims to check excessive urea use, maximise indigenous production, and promote energy efficiency.

New Urea Policy, 2015

- Incentivizes domestic manufacturers and free transport of P and K fertilisers.
- **Objectives:** Maximise indigenous urea production, promote energy efficiency, rationalise subsidy burden.

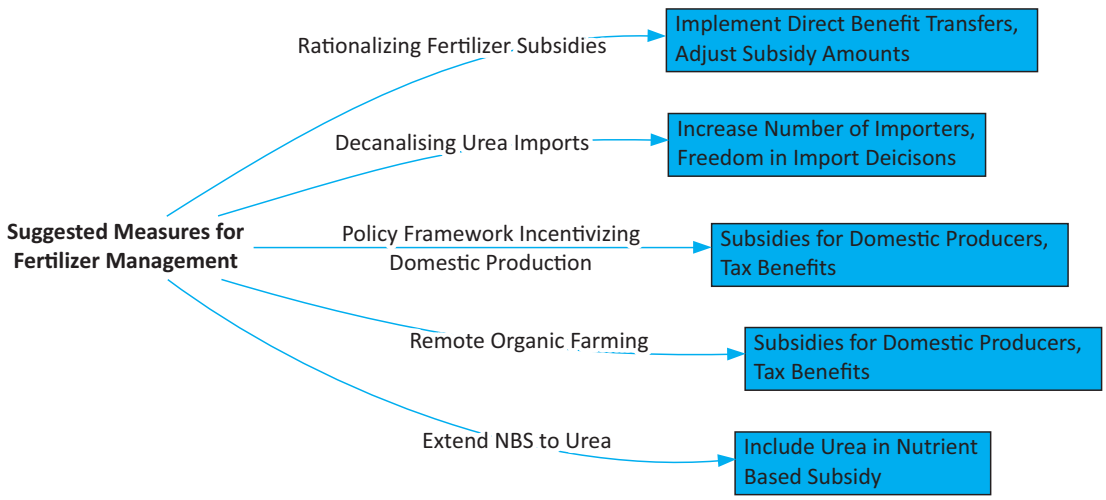

Suggested Measures for Fertilizer Management
Rationalizing Fertilizer Subsidies
Implement Direct Benefit Transfers, Adjust Subsidy Amounts
Decanalising Urea Imports
Increase Number of Importers, Freedom in Import Deicisons
Policy Framework Incentivizing Domestic Production
Subsidies for Domestic Producers, Tax Benefits
Remote Organic Farming
Subsidies for Domestic Producers, Tax Benefits
Extend NBS to Urea
Include Urea in Nutrient Based Subsidy

Fig. 13.45

Challenges and Solutions

- High subsidy outgo and imbalance in N:P:K ratio in soil.

Role of Technology in the Fertilizer Sector

- Use of space technology for resource mapping.
- Initiatives like soil health cards and digitization of land records for efficient subsidy transfer.

Integrated Pest Management (IPM)

- It is defined by the Food and Agriculture Organization (FAO), encompasses the utilization of all available techniques for pest control. It involves the integration of suitable measures to discourage the proliferation of pest populations, while ensuring that the use of pesticides and other interventions remains economically justified and at levels that reduce or minimize risks to human health and the environment.

ORGANIC FARMING

Organic farming can be defined as an agricultural process that uses biological fertilisers and pest control acquired from animal or plant waste.

Advantages of Organic Farming

- **Economical:** In organic farming no expensive fertilisers, pesticides, HYV seeds are required for the plantation of crops. Therefore, no extra expense.
- **Good return on Investment:** With the usage of cheaper and local inputs, a farmer can make a good return on investment.
- **High Demand:** There is a huge demand for the organic product in India and across the globe, generating more income through export.

- **Nutritional:** As compared to chemical and fertiliser utilised products, organic products are more nutritional, tasty, and good for health.
- **Environment-Friendly:** The farming of organic products is free of chemicals and fertilisers, so it doesn't harm the environment.

Disadvantages of Organic Farming

- **Incompetent:** The major issue of organic farming is the lack of Inadequate infrastructure and marketing of the product.
- **Less production:** The organic farming products are lesser in the initial years as compared to the chemical product. So, the farmers find it difficult to accommodate large scale production.
- **Shorter shelf-life:** Organic products have more flaws and shorter shelf life than the chemical product. (Organic fruits and vegetables aren't treated with waxes or preservatives, they may spoil faster.)
- **Limited production:** Off-season crops are limited and have fewer choices in organic farming. As the yield productivity is less in organic farming the cost of food is very high.

Government Initiatives to Prime Organic Farming

The Government of India promotes organic farming through two dedicated schemes:

- Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)
- Paramparagat Krishi Vikas Yojana (PKVY)

Paramparagat Krishi Vikas Yojana:

- To promote natural resource based integrated and climate resilient sustainable farming
- To reduce the cost of agriculture to farmers through sustainable integrated organic farming systems thereby enhancing farmer's net income per unit of land.
- To protect the environment from hazardous inorganic chemicals by adoption of eco-friendly low-cost traditional techniques and farmer friendly technologies.
- To empower farmers through their own institutional development in the form of clusters and groups with capacity to manage production, processing, value addition and certification management.
- To make farmers entrepreneurs through direct market linkages with local and national markets.

Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) scheme:

- Focus on End-to-End Organic Value Chain:
- Promotes certified organic production of various crops.
- Supports development of infrastructure for:
  - **Input production:** On-farm production of organic fertilisers and biopesticides.
  - **Collection and aggregation:** Establishing centres to gather and consolidate organic produce.
  - **Processing and value addition:** Setting up units for processing and packaging organic products.
  - **Marketing and branding:** Supporting promotion and brand building for organic products from the region.
- **Focus on Farmer Empowerment:**
  - Provides financial assistance to farmers for:
    - Adopting organic farming practices.
    - Establishing on-farm input production units.
    - Joining Farmer Producer Companies (FPCs) for collective action.
  - Supports capacity building and training for farmers to effectively manage organic farms.
- **Inclusive Approach:**
  - Targets multiple stakeholders like farmers, FPCs, Self Help Groups (SHGs), processing units, and market aggregators.
  - Offers financial assistance to FPCs and SHGs for infrastructure development and collective marketing initiatives.
  - Supports setting up organic processing units and marketing infrastructure.

To certify produce as organic, the Food Safety & Standards Authority of India (FSSAI) has introduced the Food Safety & Standards (Organic Foods) Regulation, 2017. This regulation requires organic food to adhere to either of the following two certification systems:

- **National Programme for Organic Production (NPOP),** overseen by the Agricultural and Processed Food Products Export Development Authority (APEDA) in accordance with the guidelines of the Ministry of Commerce & Industry.
- **Participatory Guarantee System for India (PGS-India),** managed under the Ministry of Agriculture & Farmers Welfare.

Sikkim achieved organic practices across approximately 75,000 hectares of agricultural land, following NPOP guidelines, making it India's first fully organic state in 2015. Additionally, Sikkim received the UN Food and Agriculture Organization's Future Policy Gold Award in 2018 for becoming the world's inaugural 100 percent organic state.

Zero Budget Natural Farming (ZBNF)

- Zero budget natural farming is a method of chemical-free agriculture drawing from traditional Indian practices.
- It was originally promoted by agriculturist **Subhash Palekar**, who developed it in the mid-1990s as an alternative to the Green Revolution's methods that are driven by chemical fertilisers and pesticides and intensive irrigation.
- Andhra Pradesh has pledged to switch to ZBNF by 2024 with govt's support.

- **ZBNF is based on 4 pillars:**
  - **Jeevamrutha:** It is a mixture of fresh cow dung and aged cow urine (both from India's indigenous cow breed), jaggery, pulse flour, water and soil; to be applied on farmland.
  - **Bijamrita:** It is a concoction of neem leaves & pulp, tobacco and green chilies prepared for insect and pest management, that can be used to treat seeds.
  - **Acchadana (Mulching):** It protects topsoil during cultivation and does not destroy it.
  - **Whapasa:** It is the condition where there are both air molecules and water molecules present in the soil.

Comparison of Organic Farming with Zero Budget Natural Farming

Category	Aspect	Organic Farming	Natural Farming (ZBNF)
Similarities			
	Sustainability	Focuses on sustainable agricultural practices.	Emphasises sustainable agricultural methods.
	Chemical Use	Avoids synthetic fertilisers and chemical pesticides.	Avoids synthetic fertilisers and chemical pesticides.
	Seed and Plant Use	Encourages the use of local breeds of seeds and plants.	Encourages the use of local breeds of seeds and plants.
	Pest Control	Utilises non-chemical homemade pest methods.	Employs non-chemical homemade pest methods.
Differences			
	Basic Definition	A holistic system designed to optimise productivity of diverse communities in the agroecosystem.	Described as "the natural way of farming" or "do nothing farming".
	Soil Management	Does not discourage basic practices like ploughing, tilling. Uses bulk organic manures like compost, vermicompost.	Preserves the natural agroecosystem by avoiding ploughing, tilling, weeding, and application of bulk manures.
	Weeding	Weeding is a part of the process.	Avoids weeding to maintain the natural ecosystem.
	Cost Implications	Can be capital-intensive due to requirements for bulk organic manures and modified agroecosystems.	Extremely low-cost, almost zero in ZBNF, using locally made preparations.

IGNITE YOUR MIND

Do you think ZBNF holds promise for sustainable agriculture in India? Discuss the necessary research and policy support required to address potential drawbacks and maximize its benefits for small and marginal farmers.

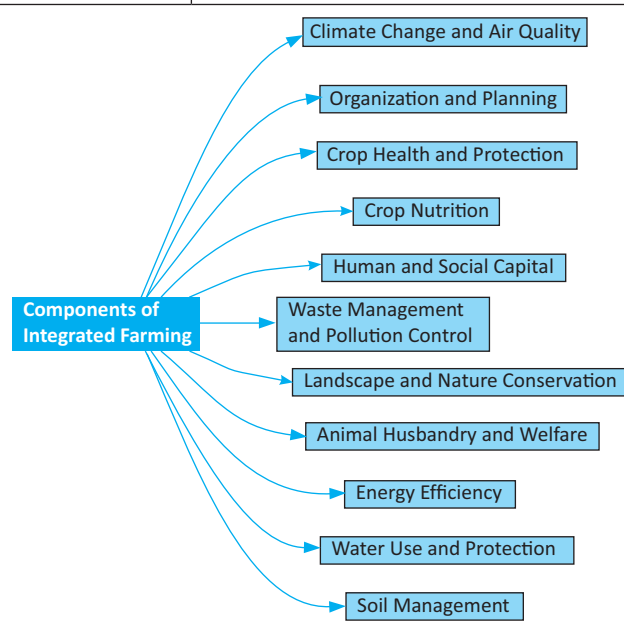


Fig. 13.46

INTEGRATED FARMING SYSTEM

Integrated Farming refers to an agriculture system that integrates livestock and crop production. It is also called an Integrated Biosystem.

- Crop
- Farming
- Livestock

- The Integrated Farming system has revolutionised conventional farming of livestock, aquaculture, horticulture, agro-industry and allied activities.
- It is a combined approach aimed at efficient sustainable resource management for increased productivity in the cropping system.
- The IFS approach has multiple objectives of sustainability, food security, farmer's security and poverty reduction by involving livestock, vermicomposting, organic farming etc.
- IFS provides multiple benefits that are sustainable and can pave the way for climate-smart agriculture. India needs to adopt a "well designed" Integrated Farming System (IFS) to realise the vision of doubling farmers' income by 2022 (Ashok Dalwai Committee) and having sustainable agricultural practices

AGRICULTURAL FINANCE

Agriculture Finance can be divided into two categories:

Non-institutional sources	Institutional sources
Moneylenders	Cooperative
Relatives	Scheduled Commercial Banks
Traders	Regional Rural Banks
Commission agents	
Landlords	

Agricultural finance can be classified as follows

On The Basis of Time Duration

- **Short-term loan:** Up to 15 months, sourced from money lenders, traders, and cooperative societies.
- **Medium-term loan:** From 15 months up to 5 years, sourced from money lenders, cooperative societies, and commercial banks. This category includes financing for fertilisers, pesticides, seeds, labour wages, repair and maintenance of wells, procurement of agricultural implements, etc.
- **Long-term loan:** Beyond 5 years, primarily sourced from Primary Cooperative Agriculture and Rural Development Banks. This type of financing aims to bring about long-term structural changes in cultivation strategies.

This categorization helps tailor financial instruments to the specific time frames and needs of agricultural activities, ensuring that farmers have access to the right type of funding for short-term inputs or long-term investments in their agricultural ventures.

On The Basis of Purpose

- **Productive Finance:** Provided by money lenders, cooperative societies, and all banks, this type of finance is directed towards enhancing agricultural production. It supports the acquisition of inputs such as fertilisers, pesticides, seeds, labour wages, tube well repair, and digging, with the goal of improving overall agricultural output.
- **Consumption Finance:** This type of finance, sourced from the informal sector like money lenders and family relatives, is intended for meeting subsistence needs and addressing basic household requirements.
- **Unproductive Finance:** Offered by the informal sector, including money lenders and family relatives, unproductive finance serves non-economic purposes. It is utilised for fulfilling significant social obligations such as marriages, rituals, festivals, etc.

This classification recognizes the diverse purposes for which agricultural finance is sought, aligning financial support with the specific needs of farmers, whether they are geared towards productivity enhancement, basic household consumption, or non-economic societal obligations.

Issues Related to Agriculture Finance in India

- **Insufficiency:** In spite of the expansion of rural credit structure, the volume of rural credit in the country is still insufficient as compared to its growing requirement arising out of the increase in prices of agricultural inputs.
- **Inadequate amount of sanction:** The amount of loan sanctioned to the farmers by the agencies is also very much inadequate for meeting their different aspects of agricultural operations. Considering the amount of loan sanctioned as inadequate and insignificant, the farmers often divert such loan for unproductive purposes and thereby dilute the very purpose of such loan.
- **Lesser attention of poor farmers:** Rural credit agencies and its schemes have failed to meet the needs of the small and marginal farmers. Thus, lesser attention has been given on the credit needs of the needy farmers whereas the comparatively well-to-do farmers are getting more attention from the credit agencies for their better creditworthiness.
- **Inadequate institutional coverage:** In India, the institutional credit arrangement continues to be inadequate as compared to its growing needs. The development of cooperative credit institutions like Primary agricultural credit societies, land development banks, commercial banks, and regional rural banks have failed to cover the entire rural farmers of the country.
- **Red-tapism:** Institutional agricultural credit is subjected to red-tapism. Credit institutions are still adopting cumbersome rules and formalities for advancing loans to farmers, which ultimately force the farmers to depend more on costly non-institutional sources of credit.

Government Measures to Promote Agri-Finance

- **Kisan credit card:** The Kisan Credit Card (KCC) scheme was launched with the aim of providing short-term formal credit to farmers.
- **Investment loan:** Loan facility to the farmers is available for investment purposes in the areas viz. Irrigation, Agricultural Mechanization, Land Development, Plantation, Horticulture and Post-Harvest Management.
- **Interest subvention scheme:** It aims at providing short term credit to farmers at subsidised interest rate
- Micro-irrigation Fund under NABARD
- SHG Bank linkage programme.
- Priority Sector lending

Agriculture Infrastructure Fund

The Agriculture Infrastructure Fund is a Central Sector Scheme introduced by the Government of India in 2020. This scheme facilitates medium to long-term loan financing to encourage investments in infrastructure, particularly in post-harvest and community farming.

Key features of the Agriculture Infrastructure Fund include

- Focus on Post-Harvest and Community Farming: The fund aims to boost investments specifically in post-harvest and community farming infrastructure.
- Interest Subvention: The scheme provides a 3% interest subvention on loans up to a limit of 2 crore for a maximum period of 7 years.
- Credit Guarantee Coverage: Credit guarantee coverage is extended for loans up to a limit of 2 crore.
- Loan Disbursement: Banks and financial institutions are collectively providing around ₹ 1 lakh crore in loans. The beneficiaries include Primary Agricultural Credit Societies (PACS), marketing cooperative societies, Farmer Producer Organizations (FPOs), Self Help Group (SHG) farmers, joint liability groups, multi-purpose cooperative societies, agricultural entrepreneurs, start-ups, and aggregation infrastructure providers. The fund also caters to Central/State agency or local body-sponsored Public-Private Partnership (PPP) projects.
- Scheme Duration: The Agriculture Infrastructure Fund operates for a duration of 10 years, spanning from 2020-21 to 2029-30.

This initiative is designed to stimulate investment in critical agricultural infrastructure, addressing post-harvest challenges and fostering community farming practices for sustainable agricultural development.

Role of NABARD in Agriculture Finance

- **Origins and Responsibilities:**
  - **Before NABARD:** Initially, the RBI handled the agriculture sector's credit needs but faced challenges due to its expanding responsibilities.
  - **Establishment of NABARD:** Formed in July 1982, based on the recommendations of the Sivaraman Committee (1979).
  - **Roles:** NABARD took over RBI's roles in agricultural finance, small-scale agriculture industries, cottage and village industries, crafts, and related rural activities.
- **Role of NABARD in the Agriculture sector in India:**
  - **Primary Institution:** Leads in the development of cottage, small, and village industries, and rural businesses.
  - **Support and Innovation:** Aids in scheme development, monitoring, and evaluation for agricultural activities.
  - **Operational Roles:** Includes funding, rehabilitation of credit institutions, training, and maintaining communication with governmental bodies.
  - **Credit Facilities by NABARD, Available Credit Facilities:**
    - **Rural Infrastructure Development Fund (RIDF):** Supports public agricultural investment in various infrastructure projects.
    - **Kisan Credit Cards:** Provides farmers with credit cards for purchasing agricultural inputs and meeting production needs.
    - **Micro Credit Innovation Scheme (MCIS):** Offers microfinance programs for the rural poor.
    - **Refinance for Rural Housing Facilities Scheme:** Funds housing projects in rural areas, including new construction and repairs.
    - **Research and Development Fund:** Focuses on in-depth research and experimental approaches in agricultural and rural development.
    - **Swarojgar Credit Card Scheme:** Aims to provide timely funding to small artisans, weavers, and micro-entrepreneurs.
    - **Farmers' Club Program:** Facilitates non-formal forums for mutual benefit between banks and rural communities.
    - **Promotion of SHGs through SHG Bank Linkage Program:** Encourages bank lending to self-help groups, primarily comprising disadvantaged women.

FDI IN AGRICULTURE SECTOR

Agriculture is vital for the economic development of a country, with around two-thirds of the global population dependent on it for livelihood. In India, 69% of the population lives in

villages, and over 49% rely on agriculture for employment, contributing 17% to national income. To enhance living standards and benefit from scientific advancements, there's a need for higher capital formation. FDI plays a crucial role in filling this capital gap, especially for technological and investment needs.

Role of FDI in Indian Agriculture

- **Technology Advancement:** FDI brings in modern scientific and technological advancements, enhancing farming capabilities.
- **Employment and Export Enhancement:** FDI leads to more employment opportunities in agriculture and positions India as a leading agricultural exporter.
- **Access to New Technologies:** Introduction of contemporary technologies through FDI aids in boosting agricultural production.

Challenges in Attracting FDI

- **Resource Utilisation:** Although India has abundant resources, there's a gap in exploitation, especially in rural areas. Addressing these underutilised resources requires an estimated $150 billion.
- **Equity and Development Disparity:** There's an uneven distribution of development between urban and rural areas, leading to social inequality.
- **Political and Federal Hurdles:** FDI requires political support and uniform policy implementation across states, focusing on areas like poverty reduction, trade liberalisation, and banking and insurance reforms.

Status of FDI Policy and Inflows

- **Agricultural Sectors Covered:** FDI up to 100% is allowed in horticulture, floriculture, seed development, animal husbandry, pisciculture, aquaculture, and related services.
- **Agriculture's Significance:** The sector is crucial for India's economy, accounting for 17% of its GDP (approx).
- **Investment Statistics:** The FDI inflows in the food processing sector also increased from USD 628.24 Million in 2018-19 to USD 904.7 Million in 2019-20
- **FDI's Impact on Indian Agriculture:**
  - **Economic Contribution:** Agriculture supports over half of India's population and contributes 20.2% of its GVA in 2020-21.
  - **India's Agrarian Output:** India leads in the production of milk, jute, organic fibres, pulses, and ranks second globally in sugarcane, wheat, rice, vegetables, fruits, groundnuts, and cotton production.
  - **Policy Changes and Liberalisation:** Post-1991 economic liberalisation, FDI policies in agriculture have been significantly reformed, allowing up to 100% foreign capital through automatic routes.

Further the Government should implement policies for sustainable agricultural development, focusing on improving the sector's health and making India an attractive investment destination.

CROP INSURANCE IN INDIA: OVERVIEW, HISTORY, AND RECOMMENDATIONS

Crop insurance is a financial instrument that protects farmers from financial losses caused by unforeseen events that damage or destroy their crops. These events can be natural disasters like droughts, floods, and hailstorms, or pest and disease outbreaks, or even price fluctuations. In exchange for paying a premium, farmers can receive compensation if their crops are affected by any of these covered events.

Overview of Different Crop Insurance Schemes

Scheme	Period	Description	Coverage and Impact
First Individual Approach Scheme	1972-1978	Initiated by General Insurance Corporation of India, Covered limited crops in select states	Focused on specific crops
Pilot Crop Insurance Scheme (PCIS)	1979-1984	Based on 'Area Approach', Targeted loanee farmers from institutional sources	Confined to specific groups of farmers
Comprehensive Crop Insurance Scheme (CCIS)	1985-1999	First nationwide scheme, Linked to short-term credit, Based on 'homogenous area approach'	Nationwide implementation
National Agricultural Insurance Scheme (NAIS)	Launched in Rabi 1999-2000	Replaced CCIS, Aimed to protect farmers against crop losses from natural calamities	Implemented by AIC, Covered all farmers and various crops, Operated in multiple states and UTs
Modified National Agricultural Insurance Scheme (MNAIS)	Started in Rabi 2010-11	Launched on pilot basis in 50 districts, Aimed to make the scheme more farmer-friendly	Covered millions of farmers and hectares of land

Scheme	Period	Description	Coverage and Impact
Pilot Weather Based Crop Insurance Scheme (WBCIS)	Launched in 2007	Provided insurance against adverse weather conditions impacting crop production	Implemented in various states, Covered large number of farmers and hectares
Pilot Coconut Palm Insurance Scheme (CPIS)	2009-10 and 2010-11	Implemented in selected areas of various states	Thousands of farmers covered, Claims paid till 2013
National Crop Insurance Programme (NCIP)	Introduced in Rabi 2013-14	Merged MNAIS, WBCIS, and CPIS with improvements for national implementation	Aimed to significantly increase farmer and area coverage by the end of Twelfth Five Year Plan

Challenges Faced in Crop Insurance

Nevertheless, the aforementioned schemes faced several shortcomings:

- Only 23 percent of the gross cropped area in the country was covered by insurance.
- Risks were not comprehensively covered for all types of calamities.
- The imposition of a cap on premium rates resulted in lower claim amounts received by farmers.
- Premium rates for commercial and horticulture crops could be as high as 25 percent, depending on the associated risk factors.
- Limited utilisation of technologies was observed.
- Delays were encountered in the disbursement of claim payments.

In an effort to address these shortcomings, a new crop insurance initiative was introduced in 2016 – the Pradhan Mantri Fasal Bima Yojana (PMFBY)

Pradhan Mantri Fasal Bima Yojana (PMFBY)

Pradhan Mantri Fasal Bima Yojana (PMFBY) is a crop insurance scheme launched by the Government of India in 2016. The scheme provides insurance cover to farmers against crop losses due to natural calamities, pests and diseases.

Features of PMFBY	Details
Basics	Launched in 2016 to replace earlier insurance schemes. Focuses on crop safety and insurance benefits for farmers.
Funding	Rs.16,000 crores allocated for 2021-22, an increase from 2020-21.
Purpose	Enhances farmers' crop safety and maximises insurance benefits. Covers commercial/horticultural crops, oilseeds, food crops.
Eligibility	Premiums vary by crop type. Mandatory for loanee farmers, optional for others. Voluntary since 2020.
Key Highlights	**Premium:** Kharif-2%, Rabi-1.5%, Commercial/horticultural-5%.
	Beneficiaries: Initially loanee farmers, now voluntary for all.
PMFBY 2.0	Revamped in 2020 for better claim processing and efficiency.
Objectives	Support long-term yield, stabilise farmers' income, promote modern farming, ensure credit flow and food security.
Risks Covered	Covers a range of natural disasters, post-harvest losses, localised issues, sowing prevention.
Features	Comprehensive coverage for losses, simplified claims, inclusion of localised disasters, direct payments to farmers.
Revamped PMFBY 2.0	Enhanced subsidies, adaptability for states/UTs, voluntary enrolment, state responsibilities.
Technology Integration	Uses apps, drones, AI, satellite imagery for management.
PMFBY in Northeast India	Faces challenges in implementation due to administrative and logistical issues.

Objectives of PMFBY

- To provide financial support to farmers suffering crop loss/damage arising out of unforeseen events.
- To stabilise the income of farmers to ensure their continuance in farming.
- To encourage farmers to adopt innovative and modern agricultural practices.
- To ensure flow of credit to the agriculture sector.

Key features of PMFBY

- **Crops covered:** The scheme covers all kharif and rabi crops, including cereals, pulses, oilseeds, cotton, sugarcane, and horticultural crops.
- **Insurance cover:** The insurance cover is between 50% and 85% of the sum insured, depending on the crop and the risk level of the area.

- **Premium:** The premium is shared between the farmer, the government, and the lending institution. The farmer's share is typically 2% of the sum insured.
- **Claim settlement:** Claims are settled within 30 days of the occurrence of the loss.

Impact of PMFBY

The PMFBY has had a significant impact on the agriculture sector in India. The scheme has helped to protect farmers from crop losses and has provided them with financial assistance to recover from these losses. The scheme has also helped to increase the credit flow to the agriculture sector.

Challenges faced by PMFBY

The PMFBY has faced some challenges, including:

- **High claim ratio:** The claim ratio under the scheme has been high, which has led to financial losses for the government.
- **Delay in claim settlement:** There have been delays in the settlement of claims under the scheme.
- **Inadequate awareness:** There is still inadequate awareness of the scheme among farmers.

The government is taking steps to address these challenges, including:

- **Taking measures to reduce the claim ratio:** The government is working with insurers to improve the risk assessment process and to reduce fraudulent claims.
- **Improving the claim settlement process:** The government is working to streamline the claim settlement process and to reduce delays.

IGNITE YOUR MIND

While FDI in agriculture holds the potential to modernize and boost production, concerns remain about land acquisition, contract farming, and potential corporate control. Do you think India should prioritize attracting large-scale FDI in agriculture, and if so, what safeguards are needed to protect the interests of small and marginal farmers?

- Raising awareness of the scheme: The government is working to raise awareness of the scheme among farmers through various outreach programs.

The PMFBY is a major step towards providing financial security to farmers in India. The scheme has the potential to play a significant role in promoting sustainable agriculture and food security in the country.

Restructured Weather-Based Crop Insurance Scheme (RWBCIS)

Key Features

- Introduction and Launch: RWBCIS was launched in 2016 by the Ministry of Agriculture & Farmers Welfare as an improved version of the Weather-Based Crop Insurance Scheme (WBCIS).
- **Objective:** The scheme aims to provide insurance protection to cultivators against adverse weather incidents, including perils such as rainfall, temperature variations, wind speed, humidity fluctuations, and hailstorms.
- **Coverage:** RWBCIS extends coverage to major food crops, oilseeds, and commercial/horticulture crops, encompassing the entire risk period from the sowing of the crop to its maturity.
- **Proxy for Crop Yields:** The scheme employs weather parameters as a proxy for crop yields, compensating cultivators for presumed crop losses due to adverse weather conditions.
- **Area Approach Basis:** RWBCIS is implemented on an 'Area Approach basis,' wherein all farmers growing notified crops, including sharecroppers and tenant farmers, are eligible for coverage.
- **Voluntary Participation:** As of the 2020 revision, RWBCIS has been made voluntary for all farmers, a departure from its previous mandatory status for loanee farmers.
- **Premium Structure:** Farmers are required to pay a premium under RWBCIS, with the amount set at 2 percent of the sum insured or the actuarial rate (whichever is lower) for kharif oilseed and food crops, 1.5 percent for rabi oilseed and food crops, and 5 percent for commercial/horticulture crops.
- **Compensation for Adverse Weather Incidence:** Claims for compensation are triggered only in the case of adverse weather incidents. The determination of adverse weather incidents involves assessing the deviation between 'Trigger Weather' and 'Actual Weather' data recorded at a designated 'reference weather station.'

These features collectively contribute to the effectiveness of RWBCIS in providing financial support and risk mitigation for farmers facing losses due to unfavourable weather conditions during the crop cultivation period.

Issues Related to Crop Insurance

- **Asymmetry of Information:** Challenges like moral hazard and adverse selection are more pronounced in crop insurance than in other forms of insurance.
- **Structural Problems:** Crop insurance in India faces design and financial issues due to the variability and risk inherent in agriculture.
- **Small and Marginal Farmers:** The vast majority of Indian farmers are small and marginal, increasing the complexity of effective insurance coverage.
- **Reliance on Area-Based Approaches:** Given India's vast geographical diversity and large number of small farmers, area-based approaches complicate crop insurance implementation.

- **Involvement of Multiple Agencies:** Effective implementation of crop insurance requires coordinated efforts among various agencies and organisations.

Recommendations for Improvement

- **Land Record Web Portal:** Development of a web portal for States to make land record data available to financial institutions.
- **Premium Rate Revisions:** Revisiting premium rates for schemes like MNAIS to make them more equitable and sustainable.
- **Monitoring by RBI and NABARD:** Enhanced monitoring of crop insurance compliance, particularly for loanee farmers, by RBI and NABARD.
- **Proactive Role of Insurance Companies and Banks:** Ensuring effective implementation of crop insurance schemes through active participation.
- **Use of Advanced Technology:** Implementing GPRS-enabled and camera-fitted mobile phones for accurate and efficient conduct of crop cutting experiments.

Future Outlook

- **Shift to Market-Based Program:** Transition from social crop insurance to market-based programs with actuarially sound premiums is a significant step.
- **Role of Technology:** Utilising advanced technology for effective implementation and creating awareness among farmers about insurance literacy.

Krishi Megh

- **Krishi Megh** serves as the data recovery center for ICAR, aiming to minimize risks and improve the quality, availability, and accessibility of e-governance, research, extension, and education in the agricultural sector in India.
- Leveraging advanced technologies like artificial intelligence and deep learning software, it facilitates the development and deployment of applications based on deep learning, such as image analysis and disease identification in livestock.
- This ensures the provision of real-time data to researchers.

Biotech-KISAN Programme

- The Biotech-KISAN program, a farmer-centric initiative under the Department of Biotechnology, Ministry of Science and Technology, has been collaboratively developed with farmers for farmers.
- Adopting a pan-India approach using a hub-and-spoke model, it encourages entrepreneurship and innovation among farmers, particularly empowering women in agriculture.
- This program effectively links available science and technology to the farming community by addressing local farmers' challenges and providing them with scientific solutions.

CONTRACT FARMING

Contract farming involves agricultural production based on forward contracts between producers and buyers.

Key Elements

It requires the producer to supply a specific agricultural commodity, adhering to predetermined type, time, price, and quantity, as per the buyer's requirements.

Mechanics of Contract Farming

- **Agreement Details:** The contract outlines conditions for farm product production and delivery to the buyer's location.
- **Farmer's Role:** The farmer commits to supplying specific quantities of a farm product, meeting quality standards, and adhering to the delivery schedule.
- **Buyer's Commitment:** The buyer agrees to purchase the product and may assist in production through inputs, land preparation, and technical advice.

Basic Components of Contract Farming

- **Elements:** These include a pre-agreed price, quality standards, quantity or acreage, and delivery timelines.
- **Benefits to Farmers:** Guaranteed market and access to production support.
- **Appeal to Buyers:** Ensures product availability for further sale or processing.

Objectives of Contract Farming

- **Agricultural Efficiency:** Aims to reduce the burden on procurement systems and increase private sector investment in agriculture.
- **Farmer Benefits:** Focuses on consistent income for farmers and promotion of processing and value addition.
- **Rural Development:** Aims to create rural employment, reduce migration, and encourage self-sufficiency.

Contract Farming in India

- **Governing Laws:** Governed by the Indian Contract Act of 1872 and provisions in the Model APMC Act of 2003.
- **Regulatory Framework:** Suggestions for independent regulation and the draft Model Contract Farming Act, 2018.
- **Contract Farming Framework:**
  - **Farmer's Responsibilities:** Planting and delivering produce as per contract, with input and technical support from the contractor.
  - **Contract Variability:** Terms depend on crop type, agencies, farmers, and technologies.

Contract Farming Business Models

- **Informal Model:** Characterised by transient, speculative agreements between small businesses and farmers.

- **Intermediary Model:** Involves a buyer subcontracting an intermediary who then contracts farmers.
- **Multipartite Model:** Involves a mix of government bodies, private companies, and sometimes financial institutions.
- **Centralised Model:** Buyer provides inputs and controls most production aspects.
- **Nucleus Estate Model:** Buyer sources from own estates and contracted farmers.

Advantages of Contract Farming

- **Market Connection:** Strengthens market ties, diminishing dependence on middlemen.
- **Improved Price Realisation:** Offers farmers better price stability and predictability.
- **Access to Technology and Services:** Facilitates the availability of modern technology, extension services, and crop insurance.
- **Reduction in Waste:** Closely located factories to farm clusters significantly lower wastage.
- **Income Stability for Farmers:** Regular and reliable income source through guaranteed purchase agreements.
- **Agro-Industry Benefits:** Ensures a steady supply of agricultural raw materials for industries.
- **Employment Opportunities:** Boosts employment in food processing and related sectors.
- **Encouragement of Young Farmers:** Makes farming a more attractive option for the younger generation.
- **Empowerment of Rural Women:** Offers roles in sorting and grading of produce, enhancing their economic participation.

Disadvantages of Contract Farming

- **Risk of Monoculture:** Promotes large-scale monoculture, potentially harming biodiversity.
- **Dependency on Companies:** Increases farmers' reliance on corporate entities for seeds and equipment.
- **Potential for Exploitation:** Risk of companies exploiting their monopsony position to offer lower prices.
- **Quality and Quantity Disputes:** High incidence of conflicts over produce quality and quantity, leading to post-harvest losses.
- **State Cooperation Necessity:** Requires alignment with state policies, often hindered by political differences.
- **Unequal Bargaining Power:** Tendency to favour larger firms or farmers, marginalising smallholders.
- **Contractual Challenges:** Issues with contract enforcement, leading to potential breaches and legal disputes.
- **Delayed Payments and Logistics:** Problems with delayed deliveries and payments, impacting farmer income.
- **Vulnerability to Market Fluctuations:** Farmers may face difficulties if market conditions change after contract signing.

Way Forward for Contract Farming in India

- **Regulatory Framework Enhancement:** Expedite the implementation of the Model Contract Farming Act, 2018, with modifications to suit local agricultural conditions. The Model Contract Farming Act, 2018 allows farmers and farmer producer organisations (FPOs) to directly link with companies, thus enhancing market linkage and removing dependence on middlemen. The Act will have an indirect effect on small and marginal farmers for a better say in determining the prices of their produce.
- **Farmer Empowerment and Protection:** Establish policies that safeguard farmers against exploitation and ensure fair contract terms and timely payments.
- **Crop Diversification Promotion:** Encourage contracts for diverse crops to mitigate monoculture risks and support biodiversity (SDG 15).
- **Technology and Innovation Access:** Facilitate farmer access to modern technologies and practices for sustainable farming.
- **Infrastructure and Market Access Improvement:** Invest in rural infrastructure to reduce post-harvest losses and improve market access.
- **Inclusivity in Contract Farming:** Include smallholder and marginalised farmers in contract farming schemes to reduce inequalities.
- **Farmer Training and Education:** Conduct training programs to enhance farmers' understanding of contracts and modern farming techniques.
- **Sustainable Farming Practices:** Encourage environmentally friendly practices in contract farming.
- **Supportive Financial Systems Creation:** Develop financial products and insurance tailored for contract farmers to mitigate market risks.
- **Collaborative Approach Adoption:** Foster collaboration between government, private sector, and farmer groups for mutual benefits in agriculture.

By focusing on these streamlined steps, India can effectively utilise contract farming to enhance agricultural growth, support farmer welfare (contributing to SDG 1 and SDG 2), and promote sustainable practices (SDG 15).

Model Contract Farming Act of 2018

The Draft Model Contract Farming Act of 2018 aims to establish a regulatory and policy framework for contract farming.

Key provisions of this draft include

- Contract farming is excluded from the jurisdiction of State Agricultural Produce Market Committees (APMCs), relieving buyers from market fees and commission charges for engaging in contract farming.
- The establishment of a State-level Contract Farming (Promotion and Facilitation) Authority is proposed to oversee the implementation of the Draft Model Act.
- The sale and purchase of contracted produce fall outside the scope of regulation governed by the respective State/Union Territory Agricultural Marketing Acts.
- Every agreement must be registered with a District Registering and Agreement Recording Committee, which can be formed at the district, taluka, or block levels and will include officials from agriculture, animal husbandry, marketing, and rural development departments.
- A clearly defined dispute resolution procedure has been outlined to address conflicts that may arise during contract farming.
- Limits on the stock holding of agricultural produce will not apply to products obtained through contract farming.
- State legislatures have the authority to enact laws on contract farming as contracts fall under the Concurrent List of the Constitution.
- The producer (i.e., farmer) is eligible for support from the buyer to enhance production through inputs like technology, pre-harvest, and post-harvest infrastructure, as specified in the agreement. However, the buyer is prohibited from constructing permanent structures on the producer's land, and the producer's land ownership rights or title cannot be transferred to the buyer.

CLIMATE SMART AGRICULTURE

According to the World bank, Climate-smart agriculture (CSA) is an integrated approach to managing landscapes – cropland, livestock, forests and fisheries – that address the interlinked challenges of food security and climate change. Climate Smart Agriculture also known as Climate Resilient Agriculture. It is the development of agriculture under new realities of climate change.

"Agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances achievement of national food security and development goals" – FAO

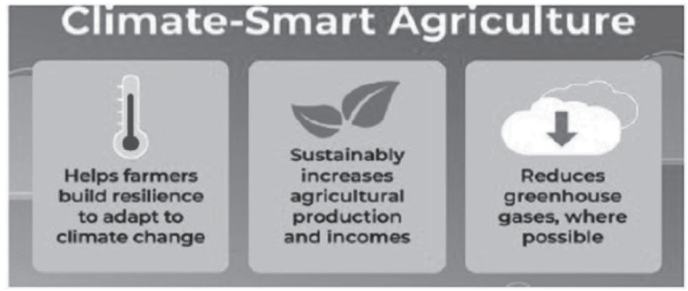

Climate-Smart Agriculture
Helps farmers build resilience to adapt to climate change
Sustainably increases agricultural production and incomes
Reduces greenhouse gases, where possible

Fig. 13.47

Importance

- **Climate change threatens food security:** With increasingly erratic weather patterns and extreme events, traditional agricultural practices become vulnerable.
- **Environmental benefits:** By reducing emissions and promoting sustainable practices, CSA mitigates climate change and protects soil health, water resources, and biodiversity.
- **Improved livelihood for farmers:** CSA empowers farmers with knowledge, tools, and resilience to improve their incomes and secure their livelihoods in the face of climate challenges.

How does it Work?

- **Sustainable land management:** Practices like no-till farming, contour cultivation, and agroforestry conserve soil and water resources.
- **Water management:** Efficient irrigation systems, water harvesting techniques, and drought-resistant crop varieties improve water use and resilience.
- **Crop diversification:** Growing a variety of crops minimises pest and disease risks, improves soil health, and provides farmers with diverse income streams.
- **Climate-informed decision making:** Utilising weather forecasts, climate data, and early warning systems helps farmers make informed decisions about planting, irrigation, and pest control.
- **Livestock management:** Improved feed management, breeding, and manure management reduce emissions and increase resource efficiency.

Challenges and Opportunities

- Limited awareness and access to information and resources.
- Policy frameworks that may not incentivize sustainable practices.
- Initial investment costs associated with adopting new technologies.

However, CSA Presents Tremendous Opportunities

- Increased food security and resilience in the face of climate change.
- Reduced environmental impact and contribution to mitigating climate change.
- Improved farmer livelihoods and rural development.

Practices Under Climate Smart Agriculture

- Minimum soil disturbance
- Zero tillage is ideal, but the system may involve controlled tillage in which no more than 20 to 25% of the soil surface is disturbed.
- Retention of crop residues or other soil surface cover
- Use of crop rotations – Crop rotation helps reduce build-up of weeds, pests and diseases. Where farmers do not have enough land to rotate crops, intercropping can be used. Legumes are recommended as rotational crops for their nitrogen-fixing functions.
- Increasing organic content of soil
- Promoting carbon soil capture

Key Initiatives Under Climate Smart Agriculture

- Paramparagat Krishi vikas yojana
- Soil health cards
- PM Fasal Bima Yojana
- PM Krishi sinchai yojana
- National mission for sustainable agriculture
- National Initiative on Climate Resilient Agriculture (NICRA)
- National Adaptation Fund
- National and State Action Plan on Climate Change.

Way Forward

- Strengthening research and development of climate-resilient technologies and practices.
- Building capacity and awareness among farmers through training and extension services.
- Developing supportive policies and incentives that encourage CSA adoption.
- Creating robust market linkages and value chains for sustainably produced agricultural products.

By embracing CSA, we can cultivate a future where agriculture thrives alongside a healthy environment. Imagine fertile fields teeming with diverse crops, farmers empowered with resilience, and communities nourished by sustainable practices.

AGRIPRENEURS

Agripreneurs are individuals who apply innovative and business-oriented approaches to traditional agricultural practices. They come from diverse backgrounds, from tech-savvy millennials to seasoned farmers, all united by a passion for making agriculture more efficient, profitable, and sustainable.

What do they do?

Their activities are as varied as the crops they grow! Here are some examples:

- **Direct-to-consumer farms:** Connecting consumers directly with fresh, locally produced food through farmers' markets, online platforms, or subscription boxes.
- **Precision agriculture:** Utilising technology like drones, sensors, and data analysis to optimise resource use, maximise yields, and minimise environmental impact.
- **Value-added products:** Transforming raw agricultural products into unique and marketable goods like artisan cheeses, craft beers, or organic beauty products.
- **Ecotourism and agritourism:** Creating immersive experiences for travellers, offering farm stays, educational workshops, and culinary adventures.
- **Social entrepreneurship:** Addressing food insecurity and environmental challenges through innovative farming methods, community gardens, and educational programs.

Why are they Important?

Agripreneurs play a crucial role in:

- **Boosting agricultural productivity and profitability:** Their innovative approaches are leading to increased yields, reduced costs, and improved incomes for farmers.
- **Creating jobs and revitalising rural communities:** Their ventures generate employment opportunities and inject fresh energy into rural areas.
- **Promoting sustainable agriculture:** They champion eco-friendly practices that conserve resources, protect biodiversity, and combat climate change.
- **Connecting consumers with their food source:** They bridge the gap between farmers and consumers, fostering transparency and creating a more vibrant food system.

Challenges and Opportunities

Like any venture, agripreneurs face challenges like access to finance, land, and technology. However, the opportunities are immense, with growing consumer demand for sustainable and locally sourced food, increasing investment in agricultural technology, and government initiatives supporting agribusiness.

ECONOMICS OF ANIMAL-REARING

Animal husbandry is the branch of agriculture concerned with the breeding and care of farm animals for food, fiber, milk, eggs, or other products. It includes a wide range of practices, from raising livestock for food to breeding and training animals for work or companionship.

Animal husbandry has been practiced for thousands of years, and it is an essential part of agriculture in many parts of the world. Today, animal husbandry is a complex and sophisticated industry that uses a variety of scientific and technological methods to improve the health, productivity, and welfare of animals.

Commodity	Food	By-products and other uses
Dairy	Fluid and dried milk, butter, cheese and curd, casein, evaporated milk, cream, yoghurt and other fermented milk, ice cream, whey	Male calves and old cows sold into the cattle commodity market, milk as an industrial feedstock of carbohydrates (lactose as a diluent for drugs), proteins (used as a surfactant to stabilize food emulsions) and fats (lipids have potential uses as emulsifiers, surfactants and gels), offal
Catle, buffalo, sheep	Meat (beef, mutton), edible tallow	Hides and skins (leather, collagens for sausage casings, cosmetics, wound dressing, human tissue repair), offal, work (traction), wool, hair, dung (as fuel and fertilizer), bone meal, religious objects, pet food, tallow and grease (fatty acids, varnish, rubber goods, soaps, lamp oil, plastics, lubricants) fat, blood meal
Poultry	Meat, eggs, dock eggs (in India)	Feathers and down, manure (as fertilizer), leather, fat, offal, flightless bed oil (carrier for dermal path pharmaceuticals), weed control (geese in mint fields)
Pig	Meat	Hades and skins, hair, lard, manure, offal
Fish (aquaculture)	Meat	Fishmeal, oil, shell, aquarium pets
Horse, other equines	Meat, blood, milk	Recreation (riding, racing), work (riding, traction), glue, dog feed, hair
Micro-livestock (rabbit, guinea pig). dog, cat	Meat	Pets, furs and skins, guard dogs, seeing-eye dogs, hunting dogs, experimentation, sheep herding (by the dog), rodent control (by the cat
Bulls		Recreation (bull-fighting, roden riding), semen
Insects and other invertebrates (eg. vermiculture, apiculture)	Honey, 500 species (grubs, grasshoppers. crickets, termites, locusts, beetle larvae, wasps and boes, moth caterpillars) are a regular diet among many non-western societies	Beeswax, silk, predatory insects (5,000 species are possible and 400 are known as controls for crop pests, the carnivorous "lox" mosquito (Tosorbynchites spp.) larvae freds on the dengue fever vector, vermicompositing, animal fodder, pollination, medicine (honeybee venom to treat arthritis), scale insect products (shellac, red food dye. cochineal)

Importance of Animal Rearing

1. Food Security

- **Animal protein:** Livestock like pigs, chickens, and sheep are vital sources of protein, essential for growth and development. Meat, eggs, and dairy products provide vital nutrients like iron, zinc, and vitamin B12, often lacking in solely plant-based diets.
- **Global sustenance:** Animal husbandry plays a critical role in feeding the world's growing population. It's estimated that livestock provides nearly 30% of all protein consumed globally, especially in developing countries where access to diverse plant-based protein sources might be limited.

2. Economic Engine

- **Livelihoods:** Millions of people worldwide depend on animal rearing for their livelihoods. Small-scale farmers rely on livestock for meat, milk, eggs, and wool, which they can sell for income or consume themselves. Large-scale animal agriculture creates jobs in various sectors, including farming, feed production, veterinary care, and food processing.
- **Rural development:** Animal husbandry can be a vital source of income and economic development in rural areas. It empowers local communities, boosts local economies, and contributes to poverty alleviation.

3. Environmental Impact

- **Soil fertility:** Manure from animals can be used as a natural fertiliser, enriching soil and reducing reliance on chemical fertilisers. This promotes sustainable agriculture and improves crop yields.
- **Reduced waste:** Food waste from crop production can be used to feed livestock, minimising food waste and promoting resource efficiency.

4. Beyond Food

- **Materials:** Animal rearing provides various materials used in different industries. Leather from cows and sheep is used for clothing, footwear, and accessories. Wool from sheep is used for textiles and insulation. Additionally, bones and horns can be used for tools and crafting materials.
- **Draft power:** In some regions, animals like horses and oxen are used for draft power, assisting with ploughing, transportation, and other agricultural tasks.

5. Cultural Significance

- **Symbolism:** Animals hold deep cultural significance in many societies worldwide. They are often seen as symbols of wealth, status, and even spiritual beliefs. In some cultures, raising and caring for animals is considered a way of life and an integral part of their traditions.

Data About Animal Rearing in India

- Livestock sector contribution to agriculture GDP-30.13% (2020-21)
- Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households.
- Livestock provides livelihood to two-third of rural community and employment to about 9% of the population in India.
- Growth rate - Nearly 8% over the last five years
- Largest Livestock Population in World
  - 57% Buffaloes
  - 13% Cattles (80% of the cattle are indigenous)

Category	Population (In million) 2012	Population (In million) 2019	% growth
Cattle	190.90	192.49	0.83
Buffalo	108.70	109.85	1.06

Category	Population (In million) 2012	Population (In million) 2019	% growth
Sheep	65.07	74.26	14.13
Goat	135.17	148.88	10.14
Pig	10.29	9.06	–12.03
Mithun	0.30	0.38	26.66
Yak	0.08	0.06	–25.00
Horses & Ponics	0.63	0.34	–45.58
Mule	0.20	0.08	–57.09
Donkey	0.32	0.12	–61.23
Camel	0.40	0.25	–37.05
Total Livestock	512.06	535.78	4.63

- Dairy Sector
  - India is the highest milk producer i.e., rank first position in the world contributing twenty-four percent of global milk production in the year 2021-22.
  - Annual growth rate of Milk production (2014-19) - 6.5% (growth rate of world milk production is 1.2%)
  - Nature of Milk distribution industry - Organized sector - 40% (cooperatives & private dairies) & unorganised sector - 60%

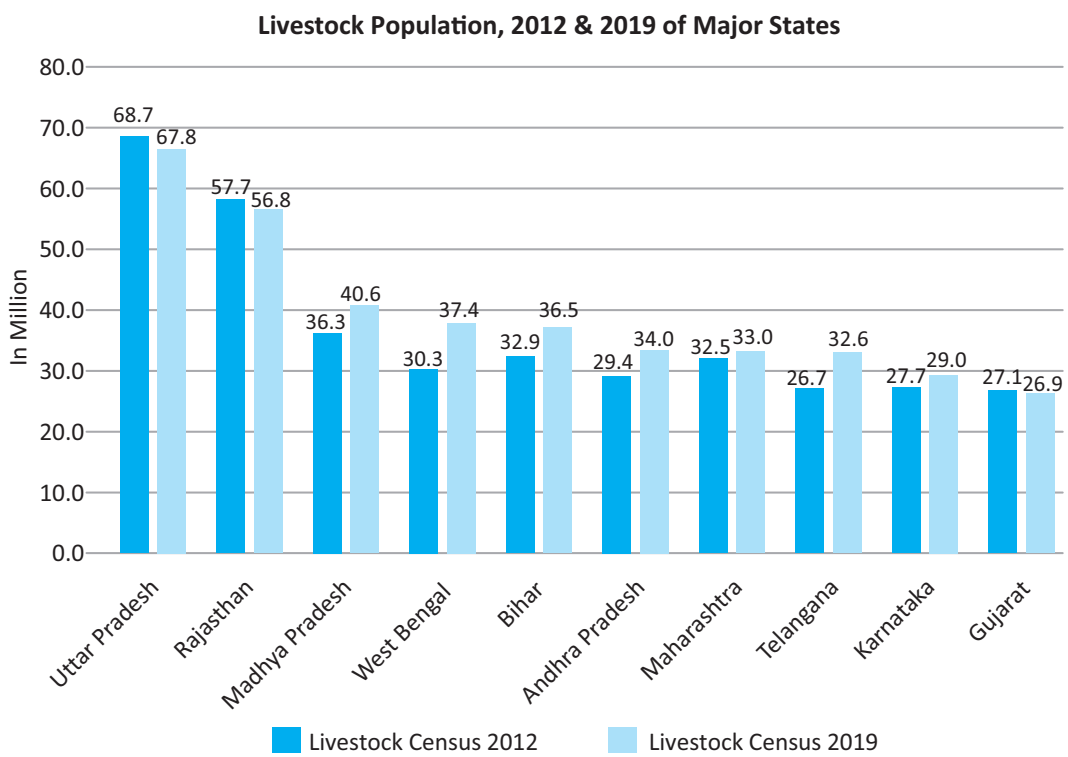


Fig. 13.48: Livestock Population, 2012 & 2019 of Major States

- Nature of Milk processing Industry - Organized sector - 20% & unorganised sector 80%.
- Socio- Economic impact of Dairy sector on Rural India - About 70 million rural households are engaged in dairying in India with 80% of total cow population.
- Per capita availability of milk (2018-19) 394 grams per day (more than world average of 302 grams)

- Fisheries
  - Fisheries contribution to agriculture GDP-7%.
  - Growth rate at around 7%

Challenges Faced in Animal Rearing

1. Low Productivity

- **Poor genetics:** Many farmers, particularly small-scale ones, rely on low-yielding breeds of cattle, poultry, and other animals. This results in lower milk production, meat yield, and egg production.
- **Inadequate feed and nutrition:** Lack of access to quality feed and balanced nutrition for animals hampers their growth and productivity.
- **Animal diseases:** Outbreaks of diseases like foot-and-mouth disease, avian influenza, and mastitis can cause significant losses in livestock numbers and productivity.

2. Infrastructure and Market Constraint

- **Limited cold chain facilities:** Lack of proper cold chain infrastructure for milk, meat, and eggs leads to spoilage and wastage, causing economic losses.
- **Poor market access:** Small-scale farmers often struggle to access good markets for their produce, fetching lower prices and facing exploitation by middlemen.
- **Inadequate veterinary services:** Limited access to qualified veterinary services in rural areas makes it difficult to diagnose and treat animal diseases promptly.

3. Environmental Concerns

- **Greenhouse gas emissions:** Methane emissions from ruminant animals like cows contribute to climate change. Additionally, livestock farming can lead to deforestation for grazing land and feed production.
- **Water pollution:** Improper disposal of animal waste can pollute water bodies, contaminating drinking water and harming aquatic life.
- **Antibiotic overuse:** Overuse of antibiotics in animal rearing can lead to antibiotic resistance in bacteria, posing a serious threat to human health.

4. Animal Welfare Issues

- **Intensive farming practices:** Confined and overcrowded conditions in factory farms can raise concerns about animal welfare, causing stress, injuries, and diseases.
- **Live transport:** Long-distance transport of animals for slaughter can be stressful and cause suffering.
- **Painful procedures:** Practices like beak trimming in poultry and tail docking in cows raise ethical concerns regarding unnecessary pain inflicted on animals.

5. Social and Economic Challenges

- **Land scarcity:** Increasing urbanisation and competition for land make it difficult for small-scale farmers to expand their animal husbandry operations.
- **Labour shortage:** The rising cost of labour and declining interest in agriculture make it challenging to find skilled workers for animal husbandry.
- **Economic volatility:** Fluctuations in feed prices, consumer demand, and market prices can impact

Steps Taken By Government

National Livestock Mission

The National Livestock Mission (NLM) is a flagship initiative of the Government of India launched in 2014-15 to boost the country's livestock sector. It aims to achieve sustainable development and growth in the sector through a multi-pronged approach focusing on:

1. **Objectives:** The primary objective of NLM is to promote sustainable growth and development of the livestock sector, particularly for poultry, goats, sheep, pigs, and other small livestock animals. This includes increasing availability of fodder and feed, risk mitigation, extension, skill development, and promoting initiatives in livestock marketing.
2. **Sub-Missions:** NLM is structured into four Sub-Missions:
   - **(a) Sub-Mission on Livestock Development:** This focuses on breed improvement, preservation, promotion of livestock products, etc.
   - **(b) Sub-Mission on Pig Development in North-Eastern Region:** This is targeted towards the development of piggery in the North-Eastern states of India.
   - **(c) Sub-Mission on Fodder and Feed Development:** This aims to address the shortage of animal feed resources in order to reduce the feed cost.
   - **(d) Sub-Mission on Skill Development, Technology Transfer, and Extension:** This focuses on capacity building and transferring technology to farmers.
3. **Implementation and Funding:** The mission is implemented through state governments and provides financial assistance in various forms, such as grants and subsidies, to support the initiatives under the mission.
4. **Benefits:** It aims to improve the livelihood of farmers, increase meat, egg, and wool production, ensure food security, reduce poverty, and provide employment opportunities, especially in rural areas.
   - **(a) Increased Productivity:**
     - **(i) Breed improvement:** The NLM promotes the use of high-yielding breeds of cattle, poultry, sheep, goats, and pigs through various schemes like Breed Development Block Programmes and genetic upgradation programmes. This aims to enhance milk production, meat yield, and egg production.
     - **(ii) Improved feed and nutrition:** The mission encourages balanced feeding practices through initiatives like fodder development programmes and promoting green fodder cultivation.

Additionally, it supports the production and supply of quality feed concentrates.

(iii) **Disease control:** The NLM emphasises animal health by supporting vaccination drives, disease surveillance, and establishing animal disease diagnostic laboratories.

(b) Entrepreneurship Development and Employment Generation:

(i) **Sub-mission on Entrepreneurship Development and Employment Generation (EDEG):** This sub-mission provides financial assistance and capacity building to individuals and groups interested in starting or expanding livestock-related businesses. It covers areas like dairy processing, poultry farming, and piggery.

(ii) **Skill development and training:** The NLM promotes skill development through training programmes for farmers and entrepreneurs in areas like animal husbandry, feed management, disease control, and value addition.

(c) Technology adoption: The NLM encourages the adoption of innovative technologies like artificial insemination, embryo transfer, and precision feeding to improve efficiency and productivity.

Animal Husbandry Infrastructure Development Fund

Animal Husbandry Infrastructure Development Fund is being implemented for funding of eligible projects set up by individual entrepreneurs, Farmers Producer Organizations, Private Companies, MSMEs and Section 8 companies for their investment for processing and value addition in the animal husbandry sector by scheduled banks. Under the scheme, credit facilities are to be made available for establishment of:

I. Dairy processing & value addition infrastructure,
II. Meat processing & value addition infrastructure,
III. Animal feed manufacturing plant and
IV. Breed Improvement Technology and Breed Multiplication farm
V. Animal waste to wealth management (Agri Waste management)
VI. Veterinary vaccine and drugs production facilities

Objectives of The Scheme

To help increasing of milk and meat processing capacity and product diversification thereby providing greater access for unorganised rural milk and meat producers to organised milk and meat market

I. To make available increased price realisation for the producer
II. To make available quality milk and meat products for the domestic consumer
III. To fulfil the objective of protein enriched quality food requirement of the growing population of the country and prevent malnutrition in one of the highest malnourished children population in the world
IV. Develop entrepreneurship and generate employment
V. To promote exports and increase the export contribution in the milk and meat sector.
VI. To make available quality concentrated animals feed to the cattle, buffalo, sheep, goat, pig and poultry to provide balanced ration at affordable prices

IGNITE YOUR MIND

Despite its economic significance and contribution to food security, animal husbandry faces numerous challenges like low productivity, infrastructure constraints, and environmental concerns. Do you think India's current policies and initiatives effectively address these challenges?

Under the scheme, the Central Government is providing 3% interest subvention. The interest subvention will be provided to the beneficiaries over a period of 8 years maximum up to 10 years of repayment period provided the beneficiaries are not defaulter and NPA.

DAIRY SECTOR IN INDIA

India's dairy sector is a powerhouse, not only within the country's economy but also on a global scale. Here's a deep dive into its significance, statistics, challenges, and opportunities:

Significance

- **World's Largest Milk Producer:** India boasts the top spot, exceeding 210 million tonnes of annual milk production, surpassing even European powerhouses like the UK and Germany.
- **Economic Engine:** The sector contributes roughly 25.8% of the value of output at current prices in the agriculture, fishing, and forestry sector. It employs millions directly and indirectly, playing a crucial role in rural livelihoods and poverty alleviation.
- **Nutritional Pillar:** Milk provides essential nutrients like protein, calcium, and vitamin B12, especially for children and vulnerable populations.
- **Cultural Importance:** Dairy products and cattle hold deep cultural significance in many Indian communities, often associated with prosperity and religious practices.

Statistics

- **Growth:** Milk production has seen a consistent rise in recent years, growing at over 5% annually.
- **Consumption:** Indians consume roughly 444 gms/day (2021-2022) higher than the global average.

- **Breeds:** The sector relies heavily on indigenous breeds like Gir, Sahiwal, and Rathi, known for their adaptability and resilience.
- **Challenges:** Despite its success, the sector faces hurdles like inadequate cold chain facilities, animal welfare concerns, and environmental impact from intensive farming practices.

Opportunities

- **Value Addition:** Processing and creating value-added products like cheese, yogurt, and ice cream offer immense potential for diversification and higher profits.
- **Technology Adoption:** Embracing technologies like artificial insemination, genetic testing, and precision feeding can further enhance productivity and sustainability.
- **Exports:** Expanding and diversifying dairy exports could further drive economic growth and improve farmer incomes.
- **Sustainable Practices:** Promoting organic farming, water conservation, and responsible waste management can address environmental concerns and ensure long-term success.

Government Initiatives

The Indian government actively supports the dairy sector through various initiatives:

- **National Livestock Mission:** Aims to improve breed quality, increase fodder availability, and strengthen infrastructure.
- **National Programme for Bovine Breeding and Dairy Development:** Focuses on genetic improvement, infrastructure development, and market access.
- **Operation Flood:** A historical program that played a pivotal role in revolutionising the dairy sector decades ago.

White Revolution (Operation Flood)

The Operation Flood initiative, instrumental in India's White Revolution, marked a significant shift in the country's dairy industry. It involved key entities like the Kaira District Cooperative Milk Producers' Union and Amul, under the guidance of leaders like Tribhuvandas Patel and Dr. Verghese Kurien. This movement, aimed at transforming India into a major milk producer, comprised various phases, each expanding the cooperative network and milk production capacity.

Impact of Operation Flood

- Substantially increased milk production and rural incomes.
- Enhanced dairy sector's contribution to the national economy.
- Improved nutritional standards across the country.
- Empowered women and marginalised communities through cooperative models.
- Fostered technological advancements and modernization in dairy farming.

Limitations of the White Revolution

- Inadequate focus on overall nutritional security.
- Regional disparities in the distribution of benefits.
- Environmental concerns associated with intensive dairy farming.
- Challenges in maintaining the cooperative model's effectiveness.
- Need for further diversification in dairy products and markets.

Way Forward

- Integrating sustainable practices in dairy farming.
- Expanding the reach to more marginalised rural communities.
- Enhancing focus on quality and variety in dairy production.
- Emphasising environmental conservation in dairy practices.
- Strengthening market linkages and global competitiveness.

White Revolution 2.0

- Embracing digital technology for efficiency in dairy cooperatives.
- Prioritising eco-friendly and organic dairy farming methods.
- Innovating with value-added dairy products.
- Strengthening the supply chain and logistics for wider reach.
- Enhancing farmers' skills and knowledge through training and education.

The future of India's dairy sector lies in addressing the challenges of the initial White Revolution while embracing innovative approaches in White Revolution 2.0, focusing on sustainability, technological advancements, and inclusive growth.

The Indian dairy sector, with its impressive growth, cultural significance, and vast potential, presents a fascinating story. Overcoming its challenges and capitalising on the available opportunities will not only solidify its economic contribution but also ensure its sustainable growth and positive impact on millions of lives.

FISHERIES SECTOR IN INDIA

The fisheries sector in India is a vibrant and vital part of the economy, playing a significant role in food security, employment, and exports. Here's a look at its key aspects:

Significance

- **3rd Largest Fish Producer:** India ranks third globally in fish production, exceeding 16.25 million metric tonnes annually.
- **Livelihood Source:** It employs over 10 million people, directly and indirectly, contributing significantly to rural livelihoods and poverty alleviation.
- **Food Security:** Fish provides essential protein and nutrients, especially for coastal communities, and contributes to national food security.
- **Export Engine:** India is the 4th largest seafood exporter, with exports exceeding $8 billion annually. This generates valuable foreign exchange and drives economic growth.

Composition

- **Marine Fisheries:** Roughly 60% of fish production comes from marine fisheries, with species like tuna, mackerel, and shrimp being major catches.
- **Inland Fisheries:** The remaining 40% comes from inland fisheries, including aquaculture in ponds, lakes, and rivers. Catla, carps, and rohu are popular freshwater fish varieties.

Challenges

- **Overfishing:** Excessive fishing pressure threatens overexploitation of certain fish stocks, requiring sustainable management practices.
- **Climate Change:** Rising sea temperatures and ocean acidification impact fish habitats and productivity, necessitating adaptation and mitigation strategies.
- **Infrastructure Gaps:** Limited cold chain facilities, processing infrastructure, and market access for small-scale fishers pose challenges.
- **Pollution:** Water pollution from industrial and agricultural waste threatens the health of aquatic ecosystems and fish populations.

Opportunities

- **Aquaculture Expansion:** Promoting sustainable aquaculture practices can increase fish production and reduce pressure on wild fish stocks.
- **Value Addition:** Processing and creating value-added seafood products like canned fish and frozen fillets can enhance profitability and create employment.
- **Technology Adoption:** Embracing technologies like fish finding radars, sustainable fishing gear, and precision aquaculture can improve efficiency and sustainability.
- **Market Diversification:** Exploring new export markets and promoting domestic consumption can further boost the sector's economic impact.

Inland fisheries

Inland fisheries in India are a vibrant and essential component of the country's aquatic food security, livelihood generation, and rural economy. Let's dive deeper into this fascinating sector:

Significance

- Production Powerhouse: The inland fisheries and aquaculture production has doubled as it increased from 61.36 lakh tons at the end of 2013-14 to 121.12 lakh tons at the end of 2021-22.
- Livelihood Lifeline: They employ over 23 million people directly and indirectly, especially in rural and remote areas, playing a crucial role in poverty alleviation and economic empowerment.
- Nutritional Pillar: Inland fish provide essential protein, vitamins, and minerals, particularly for vulnerable populations with limited access to other protein sources.
- Biodiversity Hotspot: India boasts diverse inland aquatic ecosystems like rivers, lakes, reservoirs, and floodplains, harboring a rich variety of fish species.

Composition

- Aquaculture: Plays a key role, encompassing culture-based fisheries in ponds, tanks, and cages, often focusing on carp species like Catla, Rohu, and Mrigal.
- Capture Fisheries: Involves harvesting fish from natural water bodies like rivers, lakes, and reservoirs. Catfishes, freshwater prawns, and mahseer are some popular catches.

Challenges

- Habitat Degradation: Pollution from agricultural runoff, industrial waste, and overexploitation threaten the health of aquatic ecosystems and fish populations.
- Climate Change: Rising water temperatures and changing rainfall patterns pose challenges for fish survival and productivity in inland water bodies.
- Infrastructure Gaps: Limited access to quality fish seed, feed, and cold chain facilities hinder development and market access for small-scale fishers.
- Predatory Competition: Introduction of invasive species like catfish can threaten native fish populations, impacting biodiversity and livelihoods.

Opportunities

- Sustainable Aquaculture: Promoting bio-secure and environmentally friendly aquaculture practices can enhance production and minimise environmental impact.
- Diversification: Exploring culture of high-value species like ornamental fish and prawns can boost profitability and market potential.

- Technology Adoption: Embracing technologies like fish farming software, precision feeding techniques, and advanced breeding practices can improve efficiency and productivity.
- Community Engagement: Empowering local communities through capacity building, training, and participatory management can ensure sustainable use of resources and benefit sharing.

Government Initiatives

The Indian government supports the fisheries sector through various schemes and initiatives:

- **Blue Revolution Scheme:** Aimed at increasing fish production, improving infrastructure, and promoting sustainable practices.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY):** Focuses on infrastructure development, technology adoption, and market linkages.
- **Kisan Credit Card Scheme:** Provides access to credit for fishers and aquaculture farmers.

Pradhan Mantri Matsya Sampada Yojna (PMMSY)

- PMMSY aims for a robust framework for fisheries management.
- Addresses production gaps, introduces innovation and technology.
- Seeks to enhance fish production to 220 lakh tonnes by FY 2025.
- Focuses on improving infrastructure, like cold chains and processing units.
- Encourages use of new technologies for efficient fisheries management.
- Intends to bolster the socio-economic status of fishers and fish farmers.

The Blue Revolution

The Blue Revolution in India, a vital initiative in the fisheries sector, has been pivotal in transforming the country's approach to aquaculture and fishery management. Launched during the 7th Five Year Plan (1985-1990), it was driven by key agencies like the Fish Farmers Development Agency (FFDA) and supported by various government schemes.

Blue Revolution in India

- Led by FFDA in the 7th Five Year Plan.
- Intensive Marine Fisheries Program initiated in the 8th Five Year Plan.
- Focus on increasing production from aquaculture and fisheries resources.
- Involved the creation of fishing harbors and integration with national schemes.

Objectives of Blue Revolution

- Sustainable increase in fish production.
- Emphasis on modernizing fisheries.
- Aiming for food and nutritional security.
- Enhancing export earnings and employment.

Features of the Blue Revolution

- Convergence with projects like Sagarmala and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA).
- Encouragement for economically disadvantaged groups to participate in fishing.
- Promotion of public-private partnerships (PPP) and private investments.

Current State of Indian Fisheries and Aquaculture Sector

- Diverse fish species in seas, lakes, ponds, rivers.
- Significant contributions from marine and inland fisheries resources.
- Success in brackish water aquaculture.
- India produces 7.96% of the world's fish.

The Indian fisheries sector faces both challenges and opportunities. By addressing these challenges through sustainable practices, technology adoption, and effective government support, the sector can continue to grow, providing food security, livelihoods, and economic benefits for millions of people.

All Revolutions at a Glance

Name of Revolution	Period	Revolutions Related to	Father/Mother of Revolutions
Black Revolution		Petroleum production	
Blue Revolution	1985 (during 7 FYP)	Fish production	Dr. Arun Krishnan and Dr. Hiralal Chaudhuri
Brown Revolution		Leather, cocoa	
Golden Fibre Revolution	1990	Jute production	
Golden Revolution	1991-2003	Overall horticulture, honey, fruit production	Nirpakh Tutej
Green Revolution	1966-67	Agriculture production	M. S. Swaminathan
Grey Revolution	1960-70	Fertilizer	

Name of Revolution	Period	Revolutions Related to	Father/Mother of Revolutions
Pink Revolution	1996	Pharmaceutical, onion and prawns	Durgesh Patel
Evergreen Revolution	2017-22	Overall agricultural production growth	M. S. Swaminathan
Round Revolution	1965-2005	Potato production	
Silver Fibre Revolution	2000	Cotton production	
Silver Revolution	1969-78	Egg production	Indira Gandhi
White Revolution or Operation Flood	1970-96	Dairy, milk production	Verghese Kurien
Yellow Revolution	1986-90	Oilseed production	Sam Pitroda
Saffron Energy Revolution		For promotion and better utilisation of solar energy	
Red Revolution	1980's	Meat and poultry	
Protein Revolution	2014-20	High agricultural production	Coined by Narendra Modi

Agriculture and Allied Activities-II

14

AGRICULTURE MARKETING IN INDIA

Agricultural marketing in India is a dynamic and multifaceted domain that plays a pivotal role in the country's agrarian economy.

India's agricultural market is surprisingly fragmented, despite seemingly centralised control. While state-enacted APMC Acts regulate agricultural produce, this translates to not one, but over 7,300 markets (2,477 principal + 4,843 sub-market yard across the country. This means farmers navigate a labyrinthine system to sell their goods.

The APMC Acts establish "mandis" (regulated markets) for specific commodities like cereals, vegetables, even livestock. These acts mandate selling these items only through APMC-licensed commission agents, adding an extra layer in the chain.

Despite the regulations, mandis offer some infrastructure: Auction halls, storage facilities, and even basic amenities like drinking water and sanitation. However, farmers incur various taxes and fees levied on these transactions. This intricate system, while aiming for order, presents complexities for farmers seeking optimal markets and prices.

Issues with Agricultural Marketing in India

While the official narrative paints a picture of orderly agricultural markets under APMCs (Agricultural Produce Market Committees), a closer look reveals a system riddled with complexities and hidden costs. As per Economic Survey 2019-20, these state-run market bodies levy a web of non-transparent fees that fuel political power and stifle efficient trade.

- **A Multilayered Maze of Charges:**
  - **Double Dipping:** APMCs extract fees from both buyers (market fee) and intermediaries (commissioning agents' licensing fees), adding layers of cost onto the product.
  - **Licence Raj:** A cascading system of small fees for various market functionaries (warehousing, loading, etc.) further burdens the trade.
  - **Commission Creaming:** On top of these levies, commission agents charge hefty fees on transactions, eating into farmers' profits.
- **Taxing Inefficiencies:**
  - **State-by-State Disparity:** The levies and charges vary widely across states, creating market distortions and hindering the flow of agricultural goods.
  - **Cascading Costs:** High taxes at the first trading level inflate prices throughout the supply chain, putting a squeeze on consumers and impacting affordability.
  - **An Impediment to Unity:** The APMC Act itself treats these markets as extensions of the state, viewing fees as taxes rather than service charges. This undermines the vision of a unified national market for agricultural commodities.
- **Lack of Transparency and Accountability:**
  - **Off-Budget Opulence:** APMCs operate independently, collecting fees that bypass the state treasury and legislative oversight. This lack of transparency raises concerns about accountability and potential misuse of funds.
  - **Cronyism and Cartel Power:** The perception of politically appointed officials and cozy relationships with commission agents fuels concerns about market manipulation and cartelization, further hindering reforms.

Process of Agricultural Marketing

Agricultural marketing encompasses the process of moving agricultural products from the farm to the consumer, encompassing various activities like:

- **Planning and research:** Determining market demand, identifying potential buyers, and developing marketing strategies.
- **Production:** Growing and harvesting crops, raising livestock, or processing raw materials into sellable products.
- **Grading and sorting:** Ensuring product quality and consistency by classifying products according to specific standards.
- **Packaging and branding:** Creating attractive and informative packaging to differentiate products and attract consumers.
- **Transportation and storage:** Efficiently moving products from the farm to markets and storing them safely to maintain quality.
- **Pricing and promotion:** Setting competitive prices and utilising various marketing channels to reach target consumers.
- **Distribution and sales:** Making products readily available to consumers through various channels like wholesale markets, retail stores, and direct-to-consumer platforms.

Importance of Agricultural Marketing

- **Increased income for farmers:** Efficient marketing ensures fair prices for farmers, leading to better income and improved livelihoods.
- **Reduced food waste:** Effective distribution channels and proper storage facilities minimise post-harvest losses, ensuring food security.
- **Improved food quality and safety:** Regulatory frameworks and quality control measures ensure consumers have access to safe and healthy food.
- **Enhanced competitiveness:** Effective marketing strategies help agricultural products compete effectively in the domestic and international markets.
- **Sustainable agricultural development:** By connecting farmers with markets and promoting sustainable practices, agricultural marketing can contribute to long-term development of the agricultural sector.

INITIATIVES TO IMPROVE MARKETING

1. Electronic National Agriculture Market (e-NAM)

The Electronic National Agriculture Market (e-NAM) is a groundbreaking initiative launched by the Government of India in 2016, aiming to revolutionise the agricultural marketing system in the country. This online trading platform has set ambitious objectives to enhance market integration, streamline transaction procedures, and provide better opportunities for farmers. Despite its significant advantages, e-NAM faces several challenges that the government is actively addressing to ensure its continued success and positive impact on the agricultural sector.

Key Features and Objectives

- **Market Integration:** e-NAM seeks to integrate markets at the state and national levels, creating a unified national market. The platform connects various Agricultural Produce Market Committees (APMC) mandis, fostering a seamless trading environment.
- **Streamlined Transactions:** It aims to simplify marketing and transaction procedures, eliminating complexities in the buying and selling of agricultural produce.
- **Online Access for Farmers:** Farmers gain online access to a broader buyer base, promoting fair competition and better opportunities.
- **Real-time Price Discovery:** e-NAM ensures real-time price discovery based on actual demand and supply, reducing information asymmetry between farmers and traders.
- **Quality Assaying Systems:** The platform establishes quality assaying systems to provide buyers with informed bidding options, ensuring the purchase of quality produce.

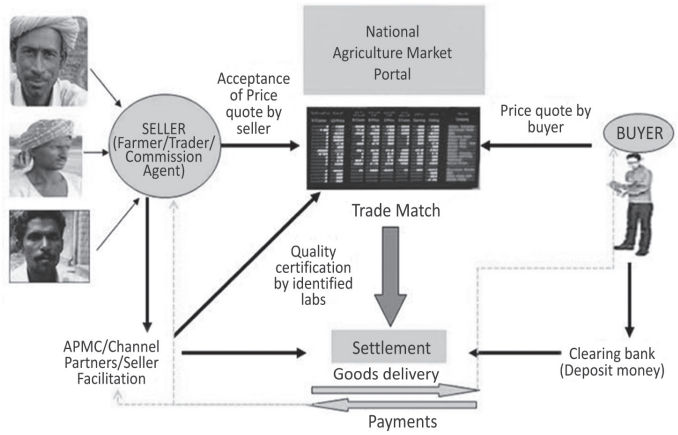


Fig. 14.1: e-NAM Mechanism

- **Transparent Pricing Information:** Transparent pricing information is made available, enhancing trust and fairness in agricultural transactions.
- **Multiple Payment Options:** Multiple payment options are offered, facilitating efficient and secure online payment processes.
- **Logistics Integration:** Integration with logistics providers enhances the transportation of agricultural produce, addressing challenges in distribution.

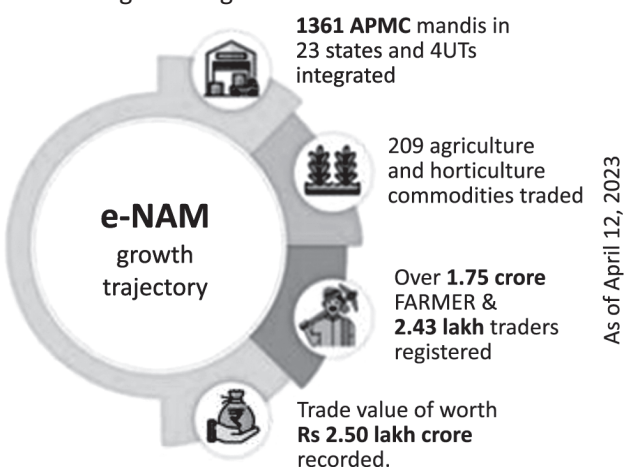

e-NAM growth trajectory
1361 APMC mandis in 23 states and 4UTs integrated
209 agriculture and horticulture commodities traded
Over 1.75 crore FARMER & 2.43 lakh traders registered
Trade value of worth Rs 2.50 lakh crore recorded.
As of April 12, 2023

Fig. 14.2

Challenges

- **Limited Internet Access and Digital Literacy:** Farmers face challenges due to limited internet access and digital literacy, hindering their full participation in the online trading process.
- **Infrastructure Gaps:** Inadequate infrastructure, including storage facilities and transportation networks, poses challenges for seamless operations.
- **Awareness and Capacity-building:** The need for increased awareness and capacity-building programs is essential to ensure that farmers and stakeholders fully understand and utilise the platform.
- **Market Imperfections:** Potential market imperfections, such as cartelization, need to be addressed to ensure fair and competitive trade practices.

- **Integration with APMCs:** Essential integration with existing Agricultural Produce Market Committees (APMCs) is crucial for the success of e-NAM.

Government Initiatives

- **Investment in Infrastructure:** The government is investing in infrastructure to address gaps in storage facilities and transportation networks.
- **Promotion of Digital Literacy:** Initiatives to promote digital literacy among farmers aim to overcome barriers related to limited internet access.
- **Enhancement of e-NAM Features:** Ongoing efforts to enhance e-NAM's features and user interface contribute to a more user-friendly experience.

Way Forward

- The government is dedicated to overcoming these challenges, envisioning a brighter future for Indian farmers and the overall agricultural sector. By continuing to invest in infrastructure, promoting digital literacy, and enhancing the features of e-NAM, the government aims to ensure sustained growth and positive outcomes for all stakeholders in the agricultural value chain.

2. E-governance Portal AGMARKNET

AGMARKNET stands as a pivotal initiative launched to offer precise and timely market information for agricultural commodities in India. Serving as a comprehensive network, it specialises in the collection, analysis, and dissemination of crucial data related to the agricultural market.

Objectives

- **Market Information Dissemination:** AGMARKNET aims to disseminate market information effectively, ensuring stakeholders have access to real-time updates.
- **Price Reporting:** It plays a crucial role in reporting accurate and up-to-date prices for various agricultural commodities, aiding informed decision-making.
- **Arrival Data Compilation:** AGMARKNET compiles arrival data, providing insights into the quantity of agricultural produce reaching the markets.
- **Promoting AGMARK Quality Certification:** The initiative actively promotes the AGMARK quality certification, fostering quality standards in agricultural products.
- **Leveraging Technology for Accessibility:** AGMARKNET embraces technology to enhance accessibility, making market information readily available to a wider audience.

Role in Agricultural Marketing

AGMARKNET plays a vital role in enhancing transparency and efficiency in agricultural marketing, benefiting multiple stakeholders:

- **Farmers:** Informed decision-making for selling agricultural produce at optimal prices.
- **Traders:** Strategic planning for procurement and sales based on accurate market information.
- **Policymakers:** Data-driven policymaking to support and optimise the agricultural marketing ecosystem.
- **Researchers:** Comprehensive data for academic studies and analysis related to agricultural markets.

AGMARKNET stands as a cornerstone in the agricultural marketing landscape of India, providing a robust network for the collection and dissemination of market information. Its objectives align with promoting transparency, efficiency, and quality standards, contributing significantly to the growth and sustainability of the agricultural sector.

3. Kisan Credit Card scheme

Kisan Credit Card (KCC) scheme introduced in 1998 for timely and adequate credit support to farmers. It operates through a single-window system, simplifying procedures for cultivation and other needs.

Expansion and Diversification

- Expanded in 2004 to cover investment credit for allied and non-farm activities.
- In 2018-19, extended to fisheries and animal husbandry for addressing working capital needs.
- Aimed at KCC saturation, including adding animal husbandry and fisheries.
- Includes waiving processing fees and raising collateral-free agriculture loan limits.

Implementation

- Implemented by various financial institutions.
- Features include an ATM-enabled RuPay debit card, one-time documentation, and cost escalation in the limit.
- Allows multiple withdrawals within the set limit.

Objectives and Achievements

- Meets short-term credit needs for various agricultural activities.
- As of June 2020, around 25 lakh applications have been sanctioned for Nationwide Fishery KCC.
- Government aims to cover 2.5 crore farmers, achieving a milestone with over 1.5 crore farmers and a sanctioned credit limit of ₹ 1.35 lakh crore.

4. Market Intelligence and Early Warning System (MIEWS) Portal

The Market Intelligence and Early Warning System (MIEWS) Portal stands as a pioneering platform designed for real-time monitoring of prices for tomato, onion, and potato (TOP). This innovative initiative is aligned with the Operation Greens (OG) scheme, introducing a groundbreaking approach to ensure timely interventions in the agricultural market.

Key Features

- **Real-time Monitoring:** The MIEWS Portal provides a first-of-its-kind real-time monitoring system for prices of TOP crops.

- **Operation Greens Scheme Integration:** The platform generates alerts for intervention in accordance with the terms of the Operation Greens scheme, enhancing the efficacy of market interventions.
- **Comprehensive Information Dissemination:** All pertinent information related to TOP crops, including Prices and Arrivals, Area, Yield and Production, Imports and Exports, Crop Calendars, Crop Agronomy, etc., is disseminated through the portal.
- **Visual Format:** The information is presented in an easy-to-use visual format, ensuring accessibility and clarity for users.

The MIEWS Portal addresses the critical need for efficient monitoring of TOP crops, which are essential components of the agricultural landscape. By offering real-time insights and generating alerts for intervention, the platform contributes to the success of the Operation Greens scheme.

5. Seamless Connectivity Through Kisan Rail and Dedicated Freight Corridors

- **Kisan Rail:**
  - Indian Railways operates Kisan Rail train services dedicated to transporting perishables and agricultural products, including milk, meat, and fish. The primary aim of these trains is to boost income in the farming sector by connecting production centres to markets and consumption centres. The inaugural Kisan Rail train commenced its journey in 2020, travelling between Devlali (Maharashtra) and Danapur (Bihar). Notably, a 50 percent freight subsidy is provided (borne by the Ministry of Food Processing Industries under the 'Operation Greens – TOP to Total' scheme) for transporting fruits and vegetables. The flexibility of no minimum quantity limit allows even small and marginal farmers to access larger and distant markets.
  - The range of commodities covered by Kisan Rail includes perishables like fruits, vegetables, meat, poultry, fishery, and dairy products, with main crops transported including oranges, onions, potatoes, bananas, mangoes, tomatoes, pomegranates, custard apples, capsicums, chikoos, and carrots. Kisan Rail serves as a crucial initiative to help farmers leverage the extensive railway network to reach distant, lucrative markets, ultimately enhancing their ability to sell produce at better prices. This aligns with the government's vision of doubling farmers' income, contributing to improved terms of trade and real returns for farmers.
- **Dedicated freight corridors:** The Dedicated Freight Corridor (DFC) network boasts two high-speed, high-capacity rail lines exclusively for transporting goods across India. Seamlessly integrating modern infrastructure and technology, the Eastern DFC (Punjab to West Bengal) serves coal mines, power plants, and industrial cities, while the Western DFC (Uttar Pradesh to Mumbai) connects major ports. World Bank funding supports the Eastern corridor, while Japan aids the Western one. This dedicated freight network aims to decongest existing lines, double freight train speeds, and ultimately strengthen India's economic transportation.

6. Formation and Promotion of FPOs

Under the **"One District One Product"** cluster to promote specialisation and better processing, marketing, branding & export.

Farmer Producer Organizations (FPOs)

- A Producer Organisation (PO) is a legal entity formed by primary producers, viz. farmers, milk producers, fishermen, weavers, rural artisans, craftsmen. A PO can be a producer company, a cooperative society or any other legal form which provides for sharing of profits/ benefits among the members. In some forms like producer companies, institutions of primary producers can also become members of PO.
- It is one type of PO where the members are farmers. Small Farmers' Agribusiness Consortium (SFAC) is providing support for promotion of FPOs. PO is a generic name for an organisation of producers of any produce, e.g., agricultural, non-farm products, artisan products, etc.

Key Objectives of FPOs

- **Empowerment:** FPOs empower farmers by aggregating production, enhancing bargaining power, and facilitating resource access.
- **Productivity Enhancement:** These organisations facilitate access to quality seeds, fertilisers, and technology, driving increased production and productivity.
- **Cost Reduction:** By engaging in bulk procurement and resource-sharing mechanisms, FPOs reduce production costs, leading to augmented profit margins.
- **Market Access Improvement:** FPOs collectively market produce, negotiate better prices, and access larger markets, thereby enhancing overall market access.
- **Post-Harvest Management:** Investments in storage, processing, and transportation infrastructure reduce post-harvest losses and elevate produce quality.
- **Financial Inclusion:** FPOs provide members with access to institutional credit and financial services, fostering financial stability and farm investments.
- **Bargaining Power:** Through collective negotiations, FPOs ensure fairer prices for farmers' produce, addressing market challenges.

Structure of FPO

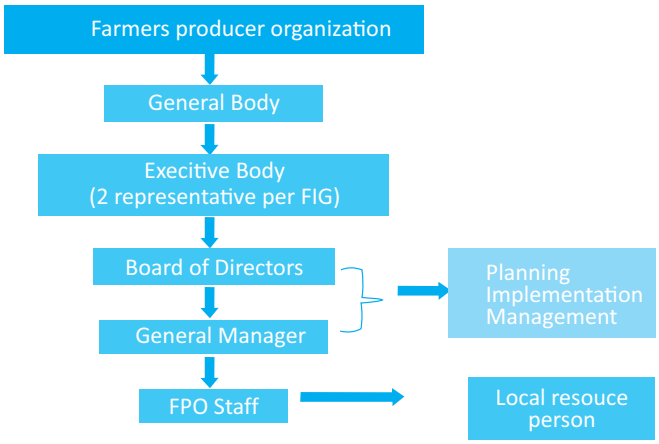


Fig. 14.3 : Structure of FPO

Current Data and Reports

- As of October 2023, there are over 10,000 registered FPOs in India, with an estimated membership of over 12 million farmers.
- The **SFAC India** reports a significant increase in the number of FPOs in recent years, demonstrating the growing recognition of their importance.
- A **NABARD** report highlights the positive impact of FPOs on farmers' income, productivity, and market access.
- A 2022 study by the **International Food Policy Research Institute (IFPRI)** found that FPOs can contribute to reducing food losses and waste in the agricultural sector.
- **Economic Survey 2023 View on FPOs:**

  The Economic Survey 2023 recognizes the potential of FPOs in transforming the agricultural landscape in India. It highlights the need for:

  - **Scaling up the FPO model:** Increasing the number of FPOs and expanding their membership base.
  - **Strengthening their institutional capacity:** Providing training and resources to FPOs to improve their management, governance, and marketing skills.
  - **Facilitating access to finance:** Connecting FPOs with financial institutions to access affordable loans and credit.
  - **Promoting technology adoption:** Encouraging FPOs to leverage technology for improved production, marketing, and resource management.
  - **Building strong market linkages:** Providing support to FPOs in establishing direct linkages with markets and value chains.

Challenges Faced by FPOs

- **Awareness and Capacity Building:** Limited awareness and capacity among farmers hinder effective FPO management.
- **Access to Finance and Resources:** FPOs face challenges in securing sufficient financial resources for their operations.
- **Institutional Weakness:** Weak institutional structures pose obstacles to transparent governance within FPOs.
- **Market Competition:** FPOs contend with market competition, necessitating strategic approaches for sustainability.
- **Infrastructure and Logistics:** Limitations in infrastructure and logistics impact the seamless functioning of FPOs.

Way Forward

- **Capacity Building:** Implementing awareness programs equips farmers with skills to manage FPOs effectively.
- **Enhanced Financial Access:** Facilitating increased access to finance through credit, grants, and subsidies strengthens FPO operations.
- **Transparent Governance:** Strengthening institutional structures ensures transparent and accountable governance within FPOs.
- **Collaboration and Networking:** Encouraging collaboration and networking among FPOs facilitates the sharing of best practices and broader market access.
- **Technology and Innovation:** Investments in technology and innovation enhance efficiency and competitiveness, driving future growth.

IGNITE YOUR MIND

Do you think that the classification of inflation based on the degree or speed of price rise provides a meaningful understanding of inflationary scenarios?

By addressing these challenges and focusing on strategic initiatives, FPOs have the potential to transform the lives of millions of farmers, contributing significantly to the holistic development of India's agricultural sector.

7. Contract farming

- Contract farming agreements between farmers and processors or buyers provide farmers with assured markets and price stability.
- The **Model APMC (Agricultural Produce Market Committee) Act, 2003** provides specific provisions for contract farming, like compulsory registration of contract farming sponsors and dispute settlement.

8. Investment in infrastructure and technology

- Upgrading infrastructure and providing farmers with access to information technology to improve marketing efficiency. For e.g. **Agriculture Infrastructure Fund, Animal Husbandry Infrastructure Development Fund.**

Agriculture Infrastructure Fund (AIF)

In order to address the existing infrastructure gaps and mobilise investment in agriculture infrastructure,this infrastructure fund was established in 2020.

Key Features

Key Features	Details
Size of the Fund	The Agriculture Infrastructure Fund is set at ₹ 1 lakh crore, released on a first-come-first-served basis. Each individual beneficiary can receive funding for up to 25 projects located in different areas.
Beneficiaries	The Agriculture Infrastructure Fund benefits a range of entities, including farmers, Farmer Producer Organizations (FPOs), Primary Agricultural Credit Societies (PACS), Entrepreneurs, Startups, Self Help Groups, Agricultural Produce Market Committees, and Federations. These groups stand to gain from the scheme's support.
Interest Subvention	The Agriculture Infrastructure Fund provides an interest subvention of 3% per annum for loans up to 2 Crore, This subvention will be available for a maximum period of seven years. NABARD loans for PACS are available at a reduced rate of 1% post subvention.
Credit Guarantee	Credit guarantee is offered by the Agriculture Infrastructure Fund for loans up to ₹ 2 crore, operating under the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) scheme.
GoI Support	The Government of India supports the lending process by facilitating and expediting sanctions through a user-friendly online portal.
Lending Institutions	The Agriculture Infrastructure Fund is accessible through various lending institutions, comprising 24 commercial banks, 40 cooperative banks, and NABARD, among others.
Convergence	The Agriculture Infrastructure Fund can be aligned with multiple schemes across ministries and state governments. This convergence is aimed at maximising impact and effectiveness.

A new campaign named **'BHARAT' (Banks Heralding Accelerated Rural & Agriculture Transformation)** has been launched by the Government under Agriculture Infrastructure Fund Scheme to provide maximum benefits to the people and to create a competitive spirit among the Banks and lending institutions to mobilise agriculture infrastructure projects loan at a faster pace.

Implementation Period of Scheme

- The Scheme will be operational from 2020-21 to 2032-33. Loan disbursement under the scheme will complete in six years, i.e. by the end of Financial Year 2025-26.
- As on 31st December 2022, ₹ 14,118 crores have been sanctioned, out of which ₹ 9117 crores have been disbursed under the scheme.

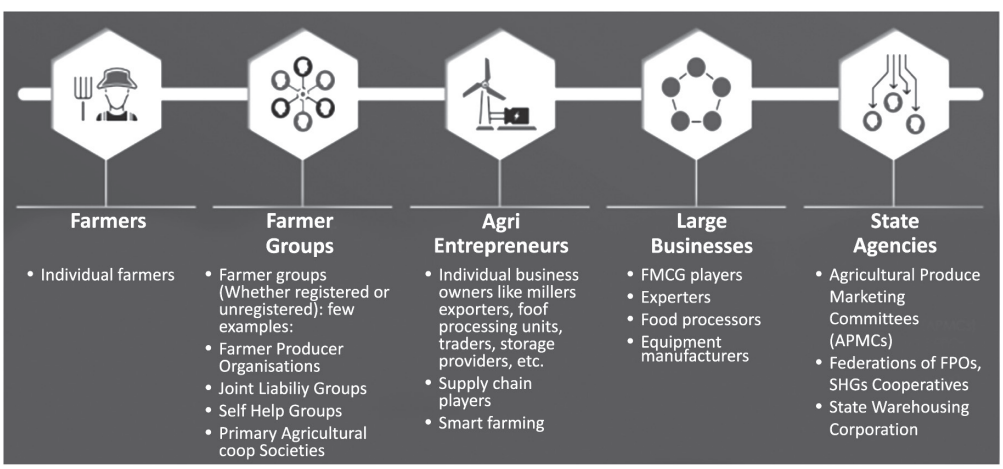

Farmers
• Individual farmers
Farmer Groups
• Farmer groups (Whether registered or unregistered): few examples:
• Farmer Producer Organisations
• Joint Liabiliy Groups
• Self Help Groups
• Primary Agricultural coop Societies
Agri Entrepreneurs
• Individual business owners like millers exporters, foof processing units, traders, storage providers, etc.
• Supply chain players
• Smart farming
Large Businesses
• FMCG players
• Experters
• Food processors
• Equipment manufacturers
State Agencies
• Agricultural Produce Marketing Committees (APMCs)
• Federations of FPOs, SHGs Cooperatives
• State Warehousing Corporation

Fig. 14.4

Remaining ₹ 90,883 crores out of ₹ 1 lakh crores will be disbursed during the remaining period between 2022-23 and 2025-26.

Repayment period covered under the financing facility will be for a maximum period of 7 years including the 6 moratorium period of up to 2 years.

Eligible Projects: The scheme will facilitate setting up and modernization of key elements of the value chain including Following projects are eligible for all beneficiaries including private entities as well as groups such as FPOs, PACS, SHGs, JLGs, Cooperatives, National and State Level Federation of Co-operatives, FPOs federations, Federations of SHGs, National and State Level Agencies.

Animal Husbandry Infrastructure Development Fund

In 2020,under the Prime Minister's AtmaNirbhar Bharat Abhiyan stimulus package it was mentioned about setting up of ₹ 15000 crore Animal Husbandry Infrastructure Development Fund (AHIDF). It aims to address critical infrastructure gaps and modernise the livestock sector in India.

The AHIDF has been approved for incentivizing investments by individual entrepreneurs, private companies, MSME, Farmers Producers Organizations (FPOs) and Section 8 companies to establish:

- **Dairy processing and value addition infrastructure**
- **Meat processing and value addition infrastructure**
- **Animal Feed Plant**
- **Breed Improvement Technology and Breed Multiplication Farm**
- **Animal Waste to Wealth Management (Agri Waste Management)**
- **Setting up of Veterinary Vaccine and Drugs Manufacturing facilities**

Key Features

- The beneficiaries are to contribute a minimum of 10% margin money as investment. The balance 90% would be the loan component to be made available by scheduled banks.
- Government of India will provide 3% interest subvention to eligible beneficiaries.
- There will be a 2 years moratorium period for principal loan amount and 6 years repayment period thereafter.
- From the Credit Guarantee Fund, Credit guarantee would be provided to those sanctioned projects which are covered under MSME defined ceilings. Guarantee Coverage would be upto 25% of Credit facility of the borrower.
- **Area of Operation:** The Animal Husbandry Infrastructure Development Fund (AHIDF) will be implemented in all States and Union Territories.
- **Implementing Agency:** Animal Husbandry Infrastructure Development Fund will be implemented by the Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying.

Objectives

- To help increasing milk and meat processing capacity and product diversification thereby providing greater access for unorganised rural milk and meat producers to organised milk and meat markets.
- To make available increased price realisation for the producer.
- To make available quality milk and meat products for the domestic consumer.
- To fulfil the objective of protein enriched quality food requirement of the growing population of the country and prevent malnutrition in one of the highest malnourished children population in the world.
- Develop entrepreneurship and generate employment.
- To promote exports and increase the export contribution in the milk and meat sector.
- To make available quality concentrated animals feed to the cattle, buffalo, sheep, goat, pig and poultry to provide balanced ration at affordable prices.

Eligible Entities (Ees) For Support Under AHIDF

Following are the eligible entities for availing benefits under the AHIDF Scheme:

(a) Farmer Producer Organization (FPO)
(b) Private companies
(c) Individual entrepreneurs
(d) Section 8 companies
(e) Micro Small and Medium Enterprises

Current Data and Achievements

- As of December 2023, the AHIDF has approved over 1,500 projects with a total loan amount exceeding ₹5,000 crore.
- These projects cover various infrastructure categories, including dairy processing plants, meat processing units, animal feed manufacturing facilities, and veterinary dispensaries.
- Initial estimates reveal that the AHIDF has the potential to increase milk processing capacity by 10% and reduce post-harvest losses by 5%, leading to significant growth and efficiency in the livestock sector.

9. Grameen Agriculture Markets (GrAMs)

- Gramin Agricultural Markets (GrAMs) in India serve as village-level platforms designed to empower farmers by offering direct access to local markets, thereby eliminating middlemen and ensuring fair returns for their produce.
- Functioning as upgraded versions of traditional rural trading centres, GrAMs focus on objectives such as improving market access, reducing post-harvest losses, and boosting the rural economy.
- These markets enhance physical infrastructure, provide market intelligence to farmers, and are increasingly linked to the electronic National Agriculture Market (eNAM). Managed by farmer-producer organisations, GrAMs have led to increased income for farmers, reduced market exploitation, improved quality standards, and stimulated rural communities.
- With over 22,000 GrAMs established across India, the government is actively promoting their integration with eNAM.
- However, challenges include ensuring infrastructure development, strengthening farmer producer organisations, promoting digital literacy among farmers, and addressing logistical issues. Despite these challenges, GrAMs hold the potential to significantly contribute to rural development and agricultural prosperity if effectively expanded and managed

10. Integrated Scheme for Agricultural Marketing (ISAM)

The Integrated Scheme for Agricultural Marketing (ISAM) launched in 2014 by the Ministry of Agriculture and Farmers' Welfare is a key government initiative aimed at transforming

India's agricultural marketing landscape. It aims to bridge the gap between farmers and markets, promoting efficient marketing infrastructure, information dissemination, and farmer empowerment.

Benefits

- **Enhanced infrastructure:** ISAM provides financial support for developing various infrastructural facilities like grading and sorting centres, auction platforms, packhouses, and cold storage units. This improves handling, reduces post-harvest losses, and adds value to produce.
- **Transparency and market access:** By strengthening Agricultural Produce Marketing Committees (APMCs) and promoting e-commerce platforms like eNAM, ISAM increases market access for farmers and reduces dependence on middlemen, leading to fairer prices.
- **Improved market information:** The scheme disseminates real-time market data on prices, arrivals, and trends through various channels like mobile apps and Farmer Producer Organizations (FPOs), enabling farmers to make informed decisions.
- **Value addition and diversification:** ISAM encourages investments in processing facilities and promotes adoption of technologies like value-added processing, encouraging farmers to explore high-value crops and diversify their income sources.
- **Farmer empowerment:** By providing training, capacity building programs, and financial assistance, ISAM empowers farmers to negotiate better prices, access markets directly, and participate actively in the marketing chain.

Challenges

- **Limited coverage:** The scheme's reach needs to be expanded to encompass more markets, commodities, and regions, particularly in remote areas.
- **Awareness and adoption:** Raising awareness among farmers, especially small and marginal ones, about the benefits of ISAM and encouraging them to actively utilise its offerings remains crucial.
- **Infrastructure gaps:** Strengthening existing APMCs and ensuring seamless integration with eNAM platforms requires continued investment in infrastructure and technological upgradation.
- **Sustainability of resources:** Ensuring long-term financial sustainability of the scheme is essential for its continued impact and effectiveness.
- **Implementation bottlenecks:** Streamlining bureaucratic processes and addressing implementation hurdles at state and local levels are necessary for efficient utilisation of allocated resources.

Potential

Despite the challenges, ISAM holds immense potential to transform India's agricultural marketing landscape. By overcoming these hurdles and focusing on effective implementation, the scheme can contribute significantly to:

- **Increased farmer income:** Improved market access, transparent pricing, and value addition can lead to a significant rise in farmer income and improve their livelihoods.
- **Reduced food wastage:** Enhanced infrastructure and efficient logistics can minimise post-harvest losses, ensuring food security and improved availability of produce for consumers.
- **Market efficiency and stability:** Real-time information and transparent pricing mechanisms can lead to a more efficient and stable agricultural market, benefiting both farmers and consumers.
- **Farmer empowerment and rural development:** By empowering farmers through knowledge, market access, and financial resources, ISAM can contribute to a more inclusive and vibrant rural economy.

Way Forward

The success of ISAM hinges on collaborative efforts from various stakeholders, including the government, private sector, NGOs, and farmer organisations. Continued investment in infrastructure, technological advancements, and farmer awareness programs is crucial for realising the scheme's full potential and ushering in a new era of agricultural marketing in India.

Agricultural Marketing Infrastructure (AMI)

Key Features:

- **Demand-driven:** Projects approved based on actual needs and interest.
- **Financial Assistance:** Subsidies of 25% or 33.33% of capital cost depending on beneficiary category.
- **Wide Reach:** Over 40,000 projects supported since 2001, creating 708.67 Lakh MT storage capacity across India.
- **Scalability:** Caters to individual farmers, groups, and larger organisations like FPOs and cooperatives.
- **Focus on Rural Areas:** Targets rural infrastructure development, directly impacting farm communities.
- **Multiple Infrastructure Types:** Supports not just godowns but also specialised options like cold storage facilities.
- **Potential for Increased Market Transparency:** Improved storage infrastructure can facilitate smoother market operations and fairer pricing mechanisms.

Future of Agricultural Marketing

- **Increased focus on sustainability:** Consumers are increasingly demanding sustainably produced food, driving the adoption of sustainable practices in agricultural production and marketing.

- **Rise of e-commerce and online marketplaces:** Online platforms are expected to play a growing role in connecting farmers directly with consumers and facilitating efficient distribution.
- **Data-driven marketing:** Farmers will increasingly utilise data analytics to make informed marketing decisions and target specific consumer segments.
- **Emerging technologies:** Technologies like blockchain and artificial intelligence are expected to further transform agricultural marketing by improving transparency, efficiency, and traceability.

By addressing current challenges and embracing emerging trends, agricultural marketing can play a vital role in improving the livelihoods of farmers, ensuring food security, and promoting sustainable agricultural development.

Model APMC Act 2003

The Model Agricultural Produce Market Committee (APMC) Act, 2003, introduced significant reforms to the agricultural market landscape in India. It aimed to address limitations of the existing APMC Acts and promote a more efficient, competitive, and farmer-centric market system.

Key Features of The Model APMC Act 2003

- **Introduction of private markets:** Allowed private individuals and entities to establish and operate markets alongside existing APMC markets.
- **Direct marketing:** Farmers gained the legal right to sell their produce directly to consumers, processors, or retailers, bypassing APMC markets if desired.
- **Contract farming:** Provided a legal framework for contract farming arrangements, offering farmers greater price stability and market access.
- **Deregulation of fees:** Removed mandatory market fees for some agricultural commodities, allowing for more competitive pricing.
- **Single-point levy:** Introduced a single-point levy on market transactions, simplifying the fee structure and reducing transaction costs.
- **Establishment of regulatory bodies:** Created State Agricultural Marketing Boards to oversee and regulate agricultural marketing activities across the state.
- **Dispute resolution mechanism:** Provided a dedicated mechanism for resolving disputes between farmers, traders, and market functionaries.

Impact of the Model APMC Act 2003

- **Increased market competition:** The introduction of private markets and direct marketing has increased competition in the agricultural market, leading to potentially better prices for farmers.
- **Improved market access:** Farmers have gained access to more diverse markets, enabling them to choose the best option for selling their produce.
- **Enhanced transparency:** Regulatory reforms have led to greater transparency in market transactions and pricing mechanisms.
- **Increased investment:** The Act has attracted private investment in agricultural marketing infrastructure and services.

Challenges and limitations

- **Incomplete implementation:** Many states have only partially adopted the provisions of the Model Act, limiting its overall impact.
- **Resistance from vested interests:** APMCs and existing market functionaries have sometimes resisted reforms, leading to delays in implementation.
- **Lack of awareness:** Many farmers are still unaware of their rights and options under the Act, hindering their ability to benefit from the reforms.
- **Market infrastructure limitations:** Inadequate infrastructure and logistics continue to pose challenges for efficient market operations.

Model Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017

In April 2017, the Model Agriculture Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017 (APLM act) was introduced with the intention of replacing the 2003 Agricultural Produce Marketing Committee (APMC) Act. This legislative proposal represents an agricultural reform initiative, seeking to empower farmers by enabling direct connections with buyers, allowing them to ascertain the optimal prices for their agricultural produce.As part of this new model law, there is a provision for the creation of regulated wholesale agricultural markets at intervals of 80 kilometres.

Key Features of the APLM Act

- **Establishment of unified markets:** This legislation eradicates market fragmentation within the State/Union Territory (UT) by eliminating the concept of a **'notified market area'** from the Agricultural Produce and Livestock Market Committee's regulation (APLM). It establishes a State/UT as a unified market.
  - The legislation aims to establish a national market for agricultural products by issuing interstate trading licences, implementing grading and standardisation, and providing quality certification.
- **Deregulation of markets:** The Act removes the monopoly of Agricultural Produce Market Committees (APMCs) and allows farmers to sell their produce outside APMC yards, promoting fair competition and price discovery.
- **Development of alternative marketing channels:** This legislation fosters a conducive environment for the establishment of operational private wholesale market

yards and farmer-consumer market yards to enhance competition among various markets.
    - It encourages direct interaction between farmers and processors/bulk buyers/exporters/end users to narrow price spreads, benefiting both producers and consumers.
- **Electronic trading platforms:** To promote transparency in trade operations and market integration across geographies, the Act encourages e-trading.
    - It advocates for cost-effective transactions by proposing a single point of levy for market fees across the state and a unified single trading licence.
- **Creation of infrastructure for storage:** Additionally, the Act permits the designation of warehouses/silos/cold storages and other structures/spaces as market sub-yards to enhance farmers' market access and linkages.
- Beyond cereals, pulses, and oilseeds, the Act permits geographically unrestricted trade in agricultural products, encompassing cotton, horticulture crops, livestock, fisheries, and poultry.
- It seeks to reduce market fees and commission charges while allocating grants for Special Commodity Market Yards and Nationally Important Market Yards. The Act ensures complete democratisation of the Market Committee and State/UT Marketing Board.

Current Data on Implementation

- As of October 2023, 24 states and union territories have adopted the APLM Act.
- Over 200 private markets have been established across the country under the Act.
- The volume of agricultural produce traded outside APMC mandis has increased significantly.
- Online trading platforms for agricultural commodities are gaining traction.
- The number of FPOs has witnessed a steady rise.

Significance of This Act

- Farmers stand to gain from this legislation as it empowers them to sell their produce to buyers of their choosing.
- The inclusion of warehouses and cold storages as regulated markets broadens the avenues for farmers to market their products, fostering competition and breaking the monopoly held by APMCs.
- The adverse impacts of multiple fees would be mitigated under this act.
- The utilisation of electronic trading platforms facilitates transactions, particularly in price determination, providing farmers with access to national markets.
- The act aligns with the government's objective of doubling farm income by 2022.
- Additionally, it enhances the prospects of the food processing industry by rendering raw materials more affordable.
- The legislation aids the Reserve Bank of India (RBI) in maintaining a healthy level of food inflation.
- Its overarching aim is to encourage direct interaction between farmers and end-users of farm commodities, including retail chains, exporters, and agro-processing industries.

Case Studies

- In **Karnataka**, the APLM Act has facilitated the establishment of several private markets, resulting in increased competition and better prices for farmers.
- In **Madhya Pradesh**, the Act has enabled farmers to sell their onions directly to consumers through online platforms, reducing post-harvest losses and increasing their income.
- In **Maharashtra**, FPOs formed under the APLM Act have successfully aggregated their produce, bargained for better prices, and accessed wider markets, leading to improved livelihoods for farmers.

Challenges Associated with it

- **Incomplete adoption by states:** Not all Indian states have yet adopted the APLM Act, hindering its nationwide impact.
- **Limited awareness among farmers:** Lack of awareness about the provisions of the Act and its benefits amongst farmers remains a challenge.

IGNITE YOUR MIND

The Model APLM Act boasts several potential benefits for farmers, but concerns linger regarding its nationwide implementation and impact on various stakeholders. Do you think complete adoption of the Act across India is necessary for achieving its goals, or can a regional approach with adaptations be more effective?

AGRICULTURAL DERIVATIVES

Agricultural derivatives are financial instruments whose value is derived from an underlying agricultural commodity or a basket of agricultural commodities. These derivatives are used by market participants to manage risk, speculate on price movements, and gain exposure to the agricultural sector.

Here are Some Common Types of Agricultural Derivatives

- **Futures Contracts:** Futures contracts are agreements to buy or sell a specified quantity of an underlying agricultural commodity at a predetermined price on a future date.

- **Use:** Farmers and producers use futures contracts to hedge against price fluctuations, while investors and speculators use them to bet on future price movements.

- **Options Contracts:** Options give the holder the right (but not the obligation) to buy or sell an underlying agricultural commodity at a predetermined price within a specified time period.
  - **Use:** Farmers and traders use options to manage risk and gain exposure to price movements with less capital than required for futures contracts.
- **Swaps:** Agricultural swaps are customised agreements between two parties to exchange cash flows based on the performance of an underlying agricultural commodity or an index.
  - **Use:** Swaps can be used for risk management, allowing parties to tailor the terms of the agreement to meet specific needs.
- **Forwards:** Similar to futures contracts, forwards are agreements between two parties to buy or sell an agricultural commodity at a future date for a predetermined price.
  - **Use:** Forward contracts are often used in over-the-counter (OTC) markets and can be customised to suit the needs of the parties involved.
- **Commodity Index Funds:** These are financial products that track the performance of a basket of agricultural commodities. Investors can buy and sell shares in these funds.
  - **Use:** Provides investors with exposure to the overall performance of the agricultural sector without directly trading individual commodities.
- **Weather Derivatives:** These derivatives derive their value from weather-related events that can affect agricultural production, such as temperature, rainfall, or frost.
  - **Use:** Farmers and agricultural businesses use weather derivatives to hedge against adverse weather conditions that may impact crop yields.

Agricultural derivatives play a crucial role in managing the inherent risks associated with agricultural production and marketing. They provide a means for market participants to protect themselves from price volatility and adverse weather conditions, ensuring a more stable and predictable operating environment.

Exploring Negotiable and Non-Negotiable Warehousing Receipts For Farmers

Warehousing receipts can be beneficial for farmers both in their negotiable and non-negotiable forms. Here's a breakdown of how each type can help:

Negotiable Warehousing Receipts (NWRs):

- **Enhanced access to credit:** Farmers can use NWRs as collateral for loans from banks and financial institutions, providing access to much-needed funds for various agricultural needs like investment, working capital, etc.
- **Improved market access and bargaining power:** By holding an NWR, farmers can postpone selling their produce until market prices become more favourable, increasing their bargaining power with buyers.
- **Increased liquidity and flexibility:** NWRs can be traded on secondary markets, allowing farmers to quickly convert their stored produce into cash without needing to find a buyer directly.
- **Reduced risks and post-harvest losses:** Warehousing ensures safe storage of produce, minimising post-harvest losses due to pests, spoilage, or unfavourable weather conditions.

Non-Negotiable Warehousing Receipts (NNWRs):

- **Safe storage and quality assurance:** NNWRs provide secure storage facilities for farmers' produce, safeguarding it from theft, damage, or unauthorised access.
- **Access to quality control and grading:** Warehouses often offer quality control and grading services, ensuring farmers receive accurate information about their produce and fair compensation based on its quality.
- **Transparency and traceability:** The warehouse receipt system provides a transparent record of storage transactions, reducing the risk of fraud or disputes.
- **Peace of mind and secure income:** NNWRs provide a secure storage option for farmers during periods of low market prices or uncertain market conditions, offering peace of mind and ensuring a guaranteed income when they decide to sell.

Choosing the right type:

The choice between NWRs and NNWRs depends on the farmer's individual needs and circumstances.

- For farmers seeking access to credit or market flexibility, NWRs are the preferred option.
- For farmers primarily concerned with safe storage and quality assurance, NNWRs offer a suitable and potentially less complex solution.

Government initiatives:

In India, the **Warehousing Development and Regulatory Authority (WDRA)** promotes the use of NWRs through various initiatives. This includes establishing a robust network of registered warehouses, facilitating access to NWR financing, and raising awareness among farmers about the benefits of the system.

Remember, both NWRs and NNWRs offer valuable tools for farmers to improve their income, manage risks, and access better market opportunities. By understanding the benefits and limitations of each type, farmers can make informed decisions about which option best suits their needs.

MINIMUM SUPPORT PRICE (MSP)

Introduced in the 1960s to overcome India's food deficit, MSP is the minimum price that the government considers remunerative for agricultural production and is hence deserving of support. In event of fall of prices in notified agricultural commodities, the government provides price support by procuring the farm produce at MSP. MSP is considered as one of the most important measures to ensure Food security and alleviate rural poverty, procure food grains for Public distribution, etc.

Current Status of MSP

At present, MSP is declared for 23 agricultural commodities by the government on the recommendation of **Commission for Agricultural Costs and Prices (CACP)** before cropping season, apart from this **Fair and Remunerative Price for sugarcane** is also declared.

Crops Covered Under Msp

Kharif Crops (14)	Rabi Crops (7)	Calender Year Crops (4)
1. Paddy 2. Jowar 3. Bajra 4. Ragi 5. Maize 6. Arhar 7. Moong 8. Urad 9. Cotton 10. Ground Nuts 11. Sunflower Seed 12. Soyabean 13. Sesame 14. Nigerseed	1. Wheat 2. Barley 3. Gram 4. Masur 5. Rapeseed and Mustard 6. Safflower 7. Torai	1. Copra 2. De-husked Coconut 3. Jute 4. Sugar Cane (FRP)
	CACP recommends MSP for 22 crops before the sowing period each year MSP of Toria is based on MSP for Rapeseeds and Mustard and for MSP De-husked Coconut is absed on the MSP of Copra. Fair and Remunerative prices for Sugar is also declared.	

Currently, MSP is Declared For 23 Agricultural Commodities

- **7 cereals** (paddy, wheat, maize, bajra, jowar, ragi and barley)
- **5 pulses** (chana, arhar/tur, urad, moong and masoor)
- **7 oilseeds** (rapeseed-mustard, groundnut, soyabean, sunflower, sesamum, safflower and niger seed)
- **4 commercial crops** (cotton, sugarcane, Copra (Milling and Ball) and raw jute).

Government is not legally bound to pay MSP even if the market rates are below the threshold prices. MSP is run entirely on executive directions and isn't guaranteed by law.

Methodology for Determining MSP

The calculation of Minimum Support Price (MSP) is currently determined by a formula that involves multiplying the production costs by 1.5.

The Commission for Agricultural Costs and Prices (CACP) assesses three categories of production costs for each crop at both state and all-India average levels.

- A2 encompasses all paid-out costs directly expended by the farmer, including cash and kind expenses on seeds, fertilizers, pesticides, hired labor, leased-in land, fuel, irrigation, etc.
- A2+FL comprises A2 along with an imputed value of unpaid family labor.
- C2 factors in estimated land rent and the cost of interest on borrowed funds for farming, adding these to A2 and FL.

Commission for Agricultural Costs and Prices (CACP)

The inception of the Agricultural Prices Commission (APC) dates back to 1965, originally established to propose Minimum Support Prices (MSPs) for various agricultural commodities. Later renamed the Commission for Agricultural Costs and Prices (CACP), it currently provides MSP recommendations for 23 crops, including wheat, rice, pulses, oilseeds, and cotton.

M S Swaminathan Committee's Recommendation on MSP

- Recommended MSP should be at least 50% more than the weighted average cost of production.
- Arrangements for MSP need to be put in place for crops other than paddy and wheat. Also, millets and other nutritious cereals should be permanently included in the PDS.

Importance and Benefits of MSP Regime

- Safety net or insurance and higher investments in agriculture and adoption of technology.
- Protection from fluctuation in global markets and food security is achieved.

- Alleviation of Rural poverty prevents rural to urban migration for jobs.
- Ensures remunerative income and helps to make informed decisions.
- Acts as a benchmark for private buyers and counters price volatility of agricultural commodities.
- Improve economic access of food to people (through procurement and distribution).
- **Crop Diversification:** There are slightly higher increases in the MSP for pulses, oilseeds and coarse cereals which helps in achieving the motive of diversifying crops.
- **Forward Chain:** The MSP leads to higher farm profits which encourage farmers to spend more on inputs, technology etc.
- **Atma-Nirbhar Bharat:** The government has focussed on increase in production per acre to fulfil the objective of Atma-Nirbhar Bharat. For instance -MSP for lentils (Masur) and mustard increased by 9% (₹ 500 per quintal) and 8% (₹ 400 per quintal) to encourage farmers to go for more production of pulses.

Fair and Remunerative Price (FRP)

It is the minimum price at which sugarcane is to be purchased by sugar mills from farmers. It is fixed by the Cabinet Committee on Economic Affairs (CCEA)) on the basis of recommendations from the Commission for Agricultural Costs and Prices (CACP) every year before cropping seasons.

Average annual production of sugarcane is around 35.5 crore tonnes (As per Economic Survey 2021-22), which is used to produce around 3 crore tonnes of sugar.

India has emerged as the world's largest producer and consumer of sugar as well as the world's 2nd largest exporter of sugar.

Impact of MSP on Cropping Pattern

- MSP-backed procurement of Wheat and Rice, especially from Punjab and Haryana has promoted rice/wheat monoculture despite lack of favourable conditions.
- Traditionally, the mainstay of Indian agriculture, millets (especially Jowar and Bajra) saw a decline.
- Heavy **FRP (Fair and Remunerative Price)** and **SAP (State Administered Price)** regime is one of the prime reasons for sugarcane cultivation in UP, Maharashtra and Bihar. Inadequate MSP protection and low procurement has led to shrinkage of area of cultivation in pulses and oilseeds and resorting to imports in times of scarcity.

Challenges Associated With MSP Regime

- **Distortion of cropping pattern and impacts on Environment.**
- **Still yield per hectare is the lowest among economies with a large agriculture sector.**
- **Can cause inflation and Detrimental to competition.**
- **Sugar industry:** Arbitrary fixation of cane prices by state governments over and above the MSP fixed by the centre has been adversely affecting the sugar mills and they are not able to pay the dues of farmers.
- **Degradation of agricultural ecosystem:** Crops which are not aligned with the agro-climatic region lead to depletion of water table, soil degradation and deterioration in water quality.
  - Rice, despite being unsuitable for growth in Punjab and Haryana (semi-arid regions), is widely grown there. This has led to deterioration of the groundwater table.
  - Stubble burning is also a consequence of Rice monoculture.
- Low awareness, accessibility and regional imbalance.
- Delay in Payments, debt obligations and market distortion.
- Agriculture Exports remain curbed as MSP prices are higher than international markets.
- The Shanta Kumar committee's report on agriculture estimates that just around 6% of the country's farmers benefit from the MSP system.
- **Excess Storage:** The stock has now become double the requirements under the schemes of PDS, Buffer stock etc.

Challenges in WTO

- India's MSP scheme for many crops has been challenged by many countries in the WTO. They have been claimed to be highly trade-distorting by its method of calculation.
  - If the current process continues, the country will face international criticism for breaching the 10 per cent norm for subsidy on farm production set by the WTO.
- **Economically Unsustainable:** The economic cost of procured rice and wheat is much higher for the FCI than the market price of the same.

Way Forward

Recommendations of NITI Aayog

- Improved facilities at procurement centres, such as drying yards, weighing bridges, toilets, etc.
- More godowns should be set up and maintained properly for better storage and reduction of wastage.
- The Procurement Centres should be in the village itself to avoid transportation costs.
- The MSP scheme requires a complete overhaul in those States where the impact of the scheme is 'nil'.

Recommendation of National Farmers Commission

- **Improvement in implementation of Minimum Support Price (MSP):** MSP arrangements must be made for crops other than paddy and wheat. Millets and other nutritious cereals should also be included in the PDS permanently.
- **Minimum capping on MSP:** MSP should be at least 50% more than the weighted average cost of production.

IGNITE YOUR MIND

Critics argue that the current MSP calculation methodology incentivizes production of water-intensive crops like rice and wheat, contributing to groundwater depletion and environmental stress. Do you think alternative cost-accounting methods like the C2+25% formula proposed by the Shanta Kumar committee offer a more sustainable approach? Analyze the potential economic and environmental implications of different cost-based MSP calculations.

Demand For Legal Guarantee For MSP in India

Currently, MSPs are not legally enforceable. This means private traders can buy crops from farmers at prices lower than MSP. The government procures a limited quantity of crops at MSP, primarily wheat and paddy, through agencies like the Food Corporation of India (FCI). Farmers' organisations have been demanding a legal guarantee for MSP to ensure:

- All farmers have access to MSP for all notified crops.
- No private trader can purchase below MSP.
- Government procurement is expanded to cover more crops and regions.

Arguments for Legal Guarantee:

- **Income security for farmers:** MSP acts as a safety net, guaranteeing a minimum price for certain crops, protecting farmers from market crashes and exploitation by middlemen.
- **Increased production and investment:** A guaranteed minimum price can incentivize farmers to invest in improved technology, land improvement, and increased production.
- **Fairer market practices:** Legalisation could regulate procurement and marketing practices, preventing unfair trade practices and ensuring farmers receive a fair share of the profits.
- **Reduced food insecurity:** Stable and higher farm incomes can contribute to increased food security, particularly for vulnerable populations.
- **Rural development:** By improving farmer incomes and promoting agricultural investment, legalising MSP could lead to broader rural development and economic growth.

Challenges and concerns:

- **Fiscal burden on the government:** Legalisation could necessitate significant government procurement and storage, leading to high financial costs and potential market distortions.
- **Implementation complexities:** Effective enforcement and regulation of a nationwide MSP system would be challenging, requiring robust infrastructure and administrative capacity.
- **Limited impact for certain crops:** MSP currently covers only a limited number of crops, leaving many farmers still vulnerable to market fluctuations.
- **Potential distortion of production patterns:** Guaranteed prices for certain crops might create an incentive for overproduction, leading to inefficiencies and resource waste.
- **Impact on international trade:** Legalisation could raise concerns about trade distortions under WTO agreements, potentially affecting India's international trade relations.

Alternative approaches:

- **Improving market infrastructure and access:** Focus on strengthening market mechanisms, farmer producer organisations (FPOs), and direct market access options to reduce dependence on MSP.
- **Income support without price intervention:** Consider alternative income support schemes for farmers, delinked from specific prices, to address income security concerns without market distortions.
- **Crop diversification and value addition:** Encourage farmers to diversify their crops and invest in value addition activities to reduce dependence on traditional MSP-covered crops.

Legalising MSP presents a complex policy challenge with both potential benefits and drawbacks. Carefully considering the arguments, challenges, and alternative approaches is crucial before deciding on the best course of action. India needs a holistic agricultural policy that addresses farmer income, fair market practices, and sustainable food security, with MSP potentially playing a role within a broader framework.

AGREEMENT ON AGRICULTURE (AOA)

- It was negotiated during the Uruguay Round of the GATT and was concluded with the establishment of the WTO in 1995.
- Through AoA, WTO aims at reforming trade in agriculture with a fair and market-driven system.
- The Agreement allows governments to support their rural economies, but only allows those policies that cause less trade "distortions".
- This agreement has fixed commitments from all member states on the following three agricultural supply chain system:-
- **Improving Market access:** This can be done by removing various trade barriers by the member states. By fixing the tariffs and progressively promoting free trade among member states which will ultimately lead to an increase in market access.
- **Domestic Subsidies:** It basically motivates for the reduction in domestic subsidies that distorts free trade and fair prices. This is based on the premise that not all subsidies distort trade to the same extent. Under this agreement, Subsidies can be categorised into the following three boxes.

Green Box	All those subsidies that do not distort trade or cause minimal distortion, come under the green box. E.g. All government services such as research, disease control, and infrastructure and food security. Also, all those subsidies are given to the farmers that directly do not affect international trade and also come under the green box.
Amber Box	All kinds of domestic subsidies or support that can distort production and trade (with some exceptions) fall into the Amber Box. The measures to support prices come under this box. The exception is the provision that accepts subsidies upto 5% of agricultural production for developed countries, 10% for developing countries.
Blue Box	All those Amber Box subsidies which tend to limit the production comes under Blue Box. This can be increased without limit as long as subsidies are linked to production-limiting programs.
Export subsidies: All those subsidies that make the export of agricultural products cheaper are called export subsidies. These are basically presumed to have trade-distorting effects. This agreement prohibits the use of export subsidies by the member states for agriculture products.	

PRADHAN MANTRI ANNADATA AAY SANRAKSHAN ABHIYAN (PM-AASHA)

The government has sanctioned a new comprehensive scheme named "Pradhan Mantri Annadata Aay Sanrakshan Abhiyan" (PM-AASHA) to guarantee Minimum Support Price (MSP) assurance for farmers.

The scheme aims to ensure profitable prices for farmers' produce, as announced in the Union Budget for 2018, with the potential to enhance farmers' income through a robust procurement mechanism coordinated with state governments.

Components of PM-AASHA

Price Support Scheme (PSS)

- Central nodal agencies will procure pulses, oilseeds, and copra, with active involvement from state governments.
- The Food Corporation of India (FCI) and the National Agricultural Cooperative Marketing Federation of India (NAFED) will facilitate the scheme's implementation.
- The Central Government will bear the procurement expenditure and losses, procuring 25% of the marketable surplus of farmers for eligible crops.
- Approximately ₹ 16,000 crores have been allocated as a bank guarantee for agencies to procure from farmers.

Price Deficiency Payment Scheme (PDPS)

- Under PDPS, the state will compensate for the difference between prices prevailing in mandis and the MSP.
- All oilseeds will be covered under PDPS, following the model of the Bhawantar Bhugtan Yojana in Madhya Pradesh and the Bhavantar Bharpai Yojana in Haryana.
- No physical procurement of crops will take place.

Pilot of Private Procurement & Stockist Scheme (PPPS)

- In select pilot districts, PPPS will be tested as an alternative to PSS and PDPS.
- Private agencies will procure oilseeds in coordination with the government.
- The chosen private agency will purchase the commodity at MSP in notified markets during the specified period from registered farmers when market prices fall below the MSP and are authorised by the state/UT government.

Benefits

- **Income security for farmers:** MSP acts as a safety net against market fluctuations.
- **Increased production and investment:** Guaranteed prices can incentivize farmers to invest and produce more.
- **Fairer market practices:** The scheme aims to reduce exploitation by middlemen and promote fair pricing.
- **Potential for rural development:** Improved farmer income can contribute to broader rural economic growth.

Challenges

- **Fiscal burden on the government:** Procurement and storage can be expensive.
- **Implementation complexities:** Effective enforcement and regulation require robust infrastructure and personnel.
- **Limited impact for some crops:** Not all crops are covered by MSP, leaving some farmers vulnerable.
- **Potential market distortions:** Guaranteed prices might encourage overproduction for certain crops.
- **International trade concerns:** Legalisation could raise WTO issues over trade distortions.

Similar Schemes Employing Price Deficiency Payments

- **Mukhya Mantri Bhavantar Bhugtan Yojana** in Madhya Pradesh for pulses and oilseeds. (Now discontinued)
- **Bhavantar Bharpai in Haryana for TOP crops** (Tomato, Onion and Potato) and Cauliflower.

While recent steps in the agriculture sector such as PM KISAN and quasi-rural basic income schemes like Telengana's Rythu Bandhu scheme are a good step, MSP reforms are a sine-qua-non for our goal to double farmer's income.

Way Forward

- Price Difference covered by the Government must be capped **(10% recommended by NITI Aayog)** to discourage cartelisation.
- Reasonable due diligence to ensure Aadhar- Bank account linkage.
- Direct Income Support schemes (e.g. PM KISAN) and Price Insurance Scheme must be considered as a non-trade distorting alternative to PDPS.

Price Deficiency Payment (PDP) Scheme By Niti Aayog

The NITI Aayog in its Three-Year Action Agenda suggested a Price Deficiency Payment System.

Under PDPS, Farmers are compensated for the difference between MSPs (for select crops) and prevailing market prices via subsidy.

The subsidy will be paid via Direct Benefit Transfer (DBT) into the farmer's Aadhar seeded Bank Account.

AGRICULTURAL TRANSPORT IN INDIA

Transporting agricultural produce in India is crucial for the nation's farming sector. The country, with its diverse landscape, relies on a complex transportation network to move goods seamlessly from farms to both domestic and international markets. This system links various agricultural regions, ensuring the timely delivery of crops. From urban hubs to rural areas, the transportation infrastructure is the lifeblood of India's agricultural supply chain, impacting efficiency, accessibility, and market integration.

The Landscape

- **Modes of Transport:** Road dominates, accounting for over 85% of agricultural freight movement. Railways play a secondary role (around 12%), while waterways are underutilised.
- **Infrastructure:** India boasts a vast road network (5.5 million km), but quality and maintenance issues persist. Railway infrastructure focuses on the bulk movement of grains, often neglecting perishable goods.
- **Logistics:** Fragmented supply chains, lack of cold chain facilities, and inefficiencies at mandis (agricultural markets) create hurdles.

Issues with The Transport of Agricultural Produce

- Lack of modern road and rail infrastructure.
- Lack of full regional connectivity, especially with Northeast India.
- Seasonally blocked routes in the Himalayan and North-eastern states.
- Over reliance on road transport instead of rail transport.
- Lack of all-weather and metalled roads in rural and tribal pockets of India.
- Usually, transport trucks' overloading leads to leakage and wastage during transit.

Steps Taken To Improve Transportation

- **Kisan Rails:** The idea behind running Kisan Rail services is to move perishables, including fruits, vegetables, meat, poultry, fishery, and dairy products, from production or surplus regions to consumption or deficient regions and speedy movement to ensure minimum damage during transit. Operational since 2020, Kisan Rail transported over 1.2 million tonnes of agricultural produce in 2022-23.
- **Krishi Udan scheme:** It was launched in August 2020, on international and national routes to assist farmers in transporting agricultural products so that it improves their value realisation.

  The scheme aims to ensure seamless, cost-effective, time-bound air transportation and associated logistics for all Agri-produce originating especially from Northeast, hilly and tribal regions of the country.
- **Pradhan Mantri Gram Sadak Yojana:** It is a nationwide plan in India to provide good all-weather road connectivity to unconnected rural habitations. Pradhan Mantri Gram Sadak Yojana (PMGSY)-III was launched in the year 2019 for consolidation of 1,25,000 Km Through Routes and Major Rural Links connecting habitations, inter-alia, to Gramin Agricultural Markets (GrAMs)
- **Dedicated freight corridor:** They are dedicated for agro-products. Andhra Pradesh flagged off India's first fruit train carrying locally grown bananas to JNPT. Eastern DFC & Western DFC are partially operational, with more corridors under development.
- **Shift from road to rail network:** About 1.9% of the perishable fruits and vegetables are transported through rail, while 97.4% of the produce is transported through roads.
- **One Nation One Market:** Promotes seamless movement of agricultural produce across state borders.
- **Digital Agriculture Mission:** Focuses on leveraging technology for real-time market information, cold chain development, and efficient logistics management.

Improving agricultural produce transportation in India requires a multi-pronged approach involving infrastructure development, technology adoption, efficient logistics management, and farmer empowerment. By utilising available government data sources and actively addressing existing challenges, India can achieve a more efficient and resilient agricultural transport system, benefiting farmers, consumers, and the entire food value chain.

DOUBLING FARM INCOME

For too long, the focus on agriculture has been solely on maximising output. However, a crucial shift is taking place: recognizing that enriching farmers is not just an ethical imperative but a key driver of increased agricultural production. This understanding has propelled farm income enhancement to the forefront of government policy.

Dalwai Committee Recommendations

In 2016, the Indian government established the Committee on Doubling Farmers' Income (DFI), also known as the Dalwai Committee, to analyse the agricultural sector and recommend strategies to double farmers' income by 2022-23.

Key Recommendations

The Dalwai Committee's recommendations focused on six major areas:

Post-harvest interventions	❑ **Boosting post-harvest infrastructure:** This includes investing in storage facilities, processing units, and transportation networks to reduce post-harvest losses and ensure smooth product delivery. ❑ **Developing effective market intelligence systems:** Providing farmers with timely information about market prices, demand, and trends will help them make informed decisions and maximise profits.
Diversification and Value Addition	❑ **Promoting crop diversification:** Encouraging farmers to move beyond traditional crops and diversify their production can enhance income security and resilience against market fluctuations. ❑ **Supporting value addition:** Initiatives like processing, branding, and marketing can add value to agricultural produce, increasing its market value and farmer income.
Market Reforms	❑ **Breaking trade barriers:** Removing restrictions and facilitating free movement of agricultural produce across states will promote competition and ensure fair prices for farmers. ❑ **Strengthening Farmer Producer Organizations (FPOs):** Empowering FPOs to represent farmers and negotiate better prices with buyers will improve market access and bargaining power. ❑ **Promoting e-commerce platforms:** Online platforms like eNAM can connect farmers with a wider range of buyers, leading to increased income and market transparency.
Investments in Agricultural Research and Technology	❑ **Prioritising climate-smart technologies:** Funding research and development of technologies that adapt to climate change and promote resource-efficient practices will ensure sustainable agricultural growth. ❑ **Enhancing extension services:** Providing farmers with access to new technologies, training, and information through efficient extension services is crucial for technology adoption and knowledge dissemination.
Financial Inclusion	❑ **Expanding access to credit:** Ensuring availability of affordable credit options for farmers will enable them to invest in technology, land improvement, and other income-generating activities. ❑ **Promoting financial literacy:** Educating farmers about financial management, budgeting, and loan repayment will help them make informed financial decisions and manage risks effectively.
Social Safety Nets	❑ **Strengthening crop insurance schemes:** Providing farmers with comprehensive crop insurance will protect them from financial losses due to natural disasters and crop failures. ❑ **Expanding income support programs:** Social safety nets like income support programs will provide financial stability to farmers, especially during times of crisis and hardship.

Impact and Achievements

The Dalwai Committee's recommendations have significantly influenced various government policies and initiatives aimed at improving the agricultural sector.

Notable Achievements Include

- ❑ **Launch of Mission for Integrated Development of Horticulture (MIDH):** This mission aims to boost horticultural production and improve post-harvest management.
- ❑ **Formation of the FPO Fund:** This fund provides financial assistance to FPOs for capacity building and infrastructure development.
- ❑ **Implementation of the eNAM platform:** This online platform facilitates transparent and efficient trading of agricultural produce.
- ❑ **Increase in investments in agricultural research and development:** This has led to the development of climate-resilient crops and resource-efficient technologies.
- ❑ **Expansion of crop insurance schemes:** Increased coverage and improved claim settlement processes provide greater financial protection to farmers.

Challenges and Future Prospects

Despite the progress made, achieving the ambitious goal of doubling farmers' income by 2022-23 remains a challenge.

Key obstacles include:

- **Effective implementation at state and local levels:** Ensuring consistent and efficient implementation of the recommendations across different states and regions is crucial.
- **Addressing land fragmentation:** Small landholdings limit farmers' ability to adopt new technologies and improve productivity.
- **Strengthening FPOs and farmer collectives:** Empowering FPOs and promoting collaboration amongst farmers will enhance bargaining power and market access.
- **Tackling climate change:** Implementing climate-resilient strategies and mitigating the impact of climate change on agricultural productivity is crucial for long-term sustainability.

The Dalwai Committee's recommendations offer a comprehensive roadmap for achieving sustainable agricultural growth and improving the lives of farmers. While challenges remain, continued commitment to implementing these recommendations, along with addressing the existing obstacles, can pave the way for a more prosperous and equitable future for Indian agriculture.

From Output to Income: A Paradigm Shift in Agri-Strategy

Recently, the Indian government's agri-strategy has undergone a critical transformation. Moving beyond a singular focus on boosting production, it now prioritises improving farmers' livelihoods through higher income. This is embodied in the ambitious "**seven-point strategy**" aimed at doubling farm income by 2022:

- **Irrigation Redefined:** Enhanced budget allocation promotes efficient water management, ensuring "per drop, more crop."
- **Seeding Success:** Quality seeds and soil-specific nutrients empower farmers to cultivate optimal yields.
- **Minimising Losses:** Robust warehousing and cold chains shield against post-harvest losses, safeguarding profits.
- **Value Beyond Harvest:** Food processing initiatives encourage value addition, boosting farm returns.
- **Unifying Markets:** A national farm market, free from distortions and powered by e-platforms, promises greater access and fairer prices.
- **Weathering Risks:** Affordable farm insurance helps mitigate unforeseen risks, providing financial stability.
- **Diversifying Opportunities:** Encouraging ancillary activities like poultry, beekeeping, and fisheries offers alternative income streams.

This comprehensive strategy has garnered praise from agri-experts, including renowned scientist M.S. Swaminathan. However, successfully doubling farmers' income by 2022 demands not just a sound plan, but also meticulous program execution, adequate resource allocation, and a steadfast commitment to good governance.

AGRICULTURAL SUBSIDIES IN INDIA

An agricultural subsidy is a financial or in-kind support provided by the government to farmers and agribusinesses. It aims to support farmers, enhance productivity, and ensure food security.

Types of Agricultural Subsidies

- Direct agriculture subsidy
- Indirect agriculture subsidy

Direct Agriculture Subsidy

Direct agriculture subsidies are those subsidies that are directly provided to farmers and are generally paid in the form of a direct cash subsidy.

Examples of Direct Agriculture Subsidies

- **Fertiliser Subsidy:** Urea is being provided to farmers at a statutory notified Maximum Retail Price (MRP).
- **Power Subsidy:** Farmers receive subsidised electricity for irrigation and other agricultural operations.
- **Interest Subvention:** The government provides interest subvention on loans taken by farmers for agricultural purposes.
- **Minimum Support Price (MSP):** This program guarantees a minimum price for certain crops, protecting farmers from fluctuations in market prices.
- **Crop Insurance:** The government subsidies crop insurance premiums to protect farmers from losses due to natural calamities.
- **Other subsidies are**
  - PM Kisan Scheme
  - Farm Loan Waivers.

Advantages of Direct Agriculture Subsidies

- **Increases Purchasing power for Farmers:** Boosting the purchasing power of farmers and giving them a choice to spend. For example **PM Kisan Scheme, the Rythu Bandhu Scheme**.
- **Efficient use of resources:** Direct subsidies curbs the inefficient use of resources, it prevents the misuse of public funds. It reduces government burden freeing transportation and storage costs.
- **Transparency:** It will also curb the corruption and issue of ghost beneficiaries and will bring in transparency.

Challenges of Direct Agriculture Subsidies

Direct agriculture subsidies, while offering potential benefits, face several challenges that require careful consideration:

Fiscal Burden	❑ **Government resources:** Implementing direct subsidies can significantly strain government budgets, diverting funds away from other crucial sectors like education, healthcare, and infrastructure development. ❑ **Unsustainable debt:** Accumulating debt to finance subsidies can create long-term financial difficulties for governments and limit their ability to invest in other areas.
Market Distortions	❑ **Price distortions:** Direct subsidies can distort agricultural markets by artificially lowering prices for consumers or raising prices for farmers, leading to overproduction, inefficient resource allocation, and trade imbalances. ❑ **Reduced competitiveness:** Reliance on subsidies can discourage farmers from becoming more efficient and competitive in the long run, making them vulnerable to market fluctuations and global competition.
Inequity and Inefficiency	❑ **Reaching the intended beneficiaries:** Ensuring that subsidies reach the intended farmers, particularly small and marginal farmers, can be challenging due to complex eligibility criteria and bureaucratic hurdles. ❑ **Misallocation of resources:** Subsidies may disproportionately benefit wealthy and influential farmers who have better access to information and resources, exacerbating existing inequalities in the agricultural sector. ❑ **Leakages and corruption:** Implementing large-scale subsidy programs can be susceptible to leakages and corruption, diverting resources away from their intended purpose.
Moral Hazard and Dependency	❑ **Reduced incentive to innovate:** Farmers may become reliant on subsidies and have less incentive to adopt new technologies and practices that could improve their productivity and profitability in the long run. ❑ **Long-term dependence:** Over-reliance on subsidies can create a cycle of dependence where farmers become increasingly reliant on government support, hindering their long-term sustainability and resilience.
Environmental Impact	❑ **Unsustainable practices:** Subsidies for fertilisers, pesticides, and water can encourage unsustainable agricultural practices that damage the environment, leading to soil degradation, water pollution, and loss of biodiversity. ❑ **Limited focus on sustainability:** Focusing solely on short-term production gains through subsidies may neglect long-term environmental considerations, hindering the transition to sustainable agricultural practices.

Other Challenges

- **Data limitations:** Lack of reliable data on farm income, landholdings, and production levels can make it difficult to design and implement effective subsidy programs.
- **Political interference:** Political considerations can sometimes influence the allocation of subsidies, leading to inefficient and inequitable outcomes.
- **Administrative complexities:** Efficiently administering large-scale subsidy programs can be challenging, requiring substantial resources and robust monitoring mechanisms.

Suggestions & Way Forward

- **Targeted interventions:** Focusing subsidies on specific groups of farmers in need, such as small and marginal farmers, can improve efficiency and equity.
- **Performance-based subsidies:** Linking subsidies to specific agricultural practices or outcomes, like improved soil health or increased crop yields, can incentivize sustainable and efficient production.
- **Innovation and technology:** Investing in research and development of agricultural technologies that can improve productivity and reduce environmental impact can lead to long-term sustainability.
- **Transparent and accountable systems:** Establishing robust monitoring and evaluation systems can help ensure that subsidies are used effectively and address potential leakages and corruption.
- **Holistic approach:** Addressing the challenges of direct agriculture subsidies requires a comprehensive approach that combines targeted support with investments in infrastructure, market access, and research and development, promoting sustainable and resilient agricultural practices in the long run.

By acknowledging and addressing these challenges, policymakers can design and implement more effective and sustainable direct agriculture subsidy programs that benefit farmers, the environment, and the overall economy.

Indirect Agriculture Subsidy

Indirect subsidies are those subsidies in which the cost of the product is set at a lower price than the market price. Indirect subsidies are provided in terms of tax breaks, insurance, low-interest loans, depreciation write-offs, rent rebates. India spends roughly 2% of GDP on indirect subsidies.

Examples of Indirect Agriculture Subsidies

- **Public Investment in Agriculture:** This includes investments in irrigation infrastructure, research and development, and extension services, which indirectly benefit farmers.
- **Tax Exemptions:** Agricultural income is exempt from income tax, providing a significant indirect subsidy to farmers.
- **Concessions on Inputs:** Farmers receive subsidised access to water, seeds, and other agricultural inputs.

Advantages of Indirect Agriculture Subsidies

- Key role in promoting technological and infrastructural advancements, ensuring farmers get quality inputs like Seed and Fertilizer.
- Change in behaviour and promotion of sustainable practices like crop diversification.
- Farmers training and use of technology.
- Ensures food security in the country.
- Helps to contain the migration from the agriculture sector.

Challenges of Indirect Agriculture Subsidies

- Cereal Centric supports distorted cropping patterns.
- Overuse of natural resources and corruption due to intermediaries.
- International pressure to minimise subsidies and vote bank politics create a peculiar situation.

Agricultural Subsidies in India

Data and Facts of Agricultural Subsidies in India

- **Total Subsidy:** In 2023-24, the total expenditure on subsidies is estimated to be ₹ 4,03,084 crore, a decrease of 28.3% from the revised estimate of 2022-23.
- **Food Subsidy:** Allocation to food subsidy is estimated at ₹ 1,97,350 crore in 2023-24, a 31.3% decrease over the revised estimate of 2022-23.
  - Food Subsidy includes - Subsidy to FCI, Subsidy to States and Sugar Subsidy.
- **Fertiliser Subsidy:** In 2023-24, ₹ 1,75,103 crore was budgeted for fertiliser subsidies 22% less than the revised estimates of 2022-23.
  - Fertiliser subsidies for 2022-23 have been significantly increased in response to a sharp increase in international prices of raw materials because of the Russia-Ukraine war.
- **Power Subsidy and Agriculture:** The **Standing Committee on Water Resources (2022)** noted that subsidised electricity encouraged farmers to grow water-intensive crops in water-scarce areas.

Arguments in Favour of Subsidies

- **Social Welfare:** Subsidies on essential commodities like food, fuel, and fertilisers can make them more affordable for low-income households, alleviating poverty and improving living standards.
- **Agricultural Support:** Input subsidies for fertilisers, seeds, and irrigation can help farmers reduce production costs and boost their income, contributing to food security and rural development.
- **Industrial Development:** Subsidies for specific industries can attract investments, create jobs, and stimulate economic growth.
- **Market Failure Correction:** Subsidies can address market failures like information asymmetry and imperfect competition, ensuring fair prices and protecting consumers.

Arguments Against Agricultural Subsidies in India

Despite their intended benefits, agricultural subsidies in India face significant criticism:

- **Fiscal Burden:** Agricultural subsidies represent a major drain on the government's finances, limiting resources for other essential sectors like healthcare and education.
  - As per **Economic Survey of India 2022-23,** estimates that India's total subsidy expenditure in 2022-23 will be approximately ₹ 6 lakh crore, equivalent to 2% of GDP.
  - **The Reserve Bank of India (RBI)** revealed that the value of non-performing agricultural loans written off by banks due to loan waivers has been significant, exceeding ₹ 7 lakh crore between **2017-18** and **2020-21.**

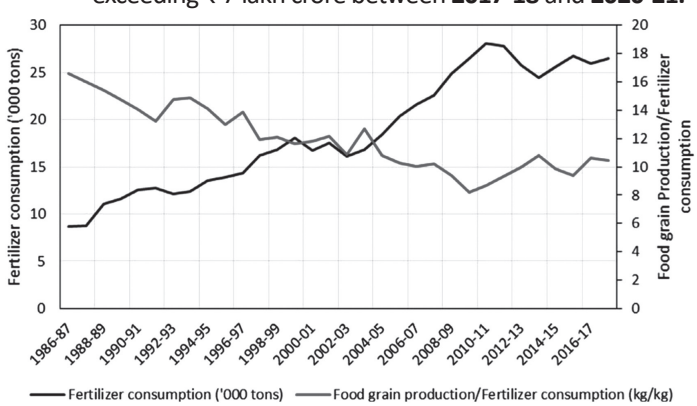


Fig. 14.5: Graph showing use of Fertiliser Consumption and Food grain

- **Inefficient Resource Allocation:** Subsidies often incentivize the overuse of fertilisers, pesticides, and water, leading to environmental degradation and inefficient resource utilisation.
- **Market Distortions:** Subsidies can create artificial price signals in the agricultural market, discouraging investment and hindering the development of a sustainable and efficient market system.
- **Limited Benefits for Small Farmers:** a significant portion of agricultural subsidies benefit large farmers and agribusinesses disproportionately, leaving small and marginal farmers marginalised.

- As per **National Bank for Agriculture and Rural Development (NABARD)**, it found that only 50% of eligible farmers received the intended benefits under various farm loan waiver schemes, highlighting implementation gaps and limited reach.

- **Environmental Impact:** Excessive use of subsidised fertilisers and pesticides contributes to soil degradation, water pollution, and greenhouse gas emissions.
  - The fertiliser subsidy budget for 2022-23 was estimated at ₹ 1,75,099.92 crore, representing a significant financial burden on the government.
  - In 2021, a report by the **International Food Policy Research Institute** linked excessive fertiliser use in India to a 1.5% reduction in crop yields and significant environmental damage.
    - Various studies indicate that over 50% of fertiliser subsidies benefit large farmers, while small and marginal farmers gain a disproportionately smaller share.

Measures to Tackle Farm Subsidies

- **National Commission on Farmers (2004):** Recommended reducing fertiliser subsidies and focusing on direct income support to farmers.
- **High-Level Panel on Agriculture (2005):** Advocated for better targeting of subsidies and promoting efficient water and energy use.
- **Kelkar Committee:(2015)** The committee recommended the phased elimination of subsidies on Diesel, Petrol, Cylinder gas and converting them to capital investments.
  - It also recommended the rationalisation of subsidy on Fertiliser.
- **Expert Committee on Doubling Farmers' Income (2018):** Suggested reforming subsidy systems to ensure they reach small and marginal farmers effectively.
- **Rationalise subsidy programs:** Reduce and phase out subsidies that are inefficient, unsustainable, or distortionary.
- **Focus on direct income support:** Provide targeted income transfers to farmers instead of input subsidies.
- **Promote efficient resource use:** Encourage farmers to adopt sustainable agricultural practices and efficient water and energy management techniques.
- **Invest in agricultural research and development:** Develop new technologies and innovations to enhance productivity and reduce input dependence.
- **Improve market access for farmers:** Strengthen infrastructure and market linkages to enable farmers to realise better prices for their produce.
- **Empower small and marginal farmers:** Tailor subsidy programs and extension services to address the specific needs of small and marginal farmers.

IGNITE YOUR MIND

Do you think the fiscal burden associated with agricultural subsidies in India poses a significant challenge to the government's ability to allocate resources for essential sectors like education and healthcare? How can the government strike a balance between supporting farmers and ensuring fiscal sustainability?

Indian Agriculture Subsidies and The WTO: A Complex and Controversial Issue

Indian agriculture and its relationship with the World Trade Organization (WTO) is a complex and often contentious issue. While India heavily subsidised its agricultural sector to support millions of farmers and ensure food security, these subsidies face scrutiny from the WTO and some member countries.

India's agricultural subsidies:

- **Types of subsidies:** India provides various subsidies to its farmers, including:
  - **Minimum support prices (MSPs):** Guaranteed prices at which the government will purchase crops from farmers if market prices fall below the MSP.
  - **Fertiliser subsidies:** Reduced prices on fertilisers, a crucial input for crop production.
  - **Electricity subsidies:** Lower electricity prices for agricultural pumps and irrigation.
  - **Interest rate subsidies:** Loans provided at lower interest rates.
- **Rationale for subsidies:** The Indian government justifies these subsidies by citing:
  - **Food security:** Ensuring sufficient food production to feed its large and growing population.
  - **Farmer livelihoods:** Supporting the millions of farmers who depend on agriculture for their income.
  - **Poverty reduction:** Helping to alleviate poverty in rural areas.
  - **Price stability:** Stabilising agricultural prices and protecting farmers from income volatility.

WTO rules and India's concerns:

- **WTO Agreement on Agriculture:** The WTO's Agreement on Agriculture sets limits on the amount of trade-distorting subsidies that member countries can provide to their farmers.
  - Developed countries have a 5% limit, while developing countries like India have a 10% limit.
- **India's concerns:** India argues that:
  - The 10% limit is unfair to developing countries with large populations and food security concerns.
  - The reference price used to calculate the subsidy limit is outdated (based on 1986-88 prices) and does not reflect current production costs.
  - Developed countries still provide significant agricultural support through various loopholes in the WTO rules.

Current status and future outlook:

- **Peace clause:** India invoked the WTO's "peace clause" in 2015, temporarily exempting its food security programs from legal challenges. This clause is set to expire in December 2023.
- **Negotiations:** Negotiations on reforming the Agreement on Agriculture are ongoing, but progress has been slow.
- **India's stance:** India is pushing for changes to the WTO rules that would take into account the specific needs of developing countries and their food security concerns.

The issue of Indian agricultural subsidies and the WTO is complex and multifaceted. There are valid arguments on both sides, and finding a solution that is fair and beneficial to all WTO members will be a difficult challenge.

LOAN WAIVERS: ARE THEY REALLY VIABLE ?

Several state governments have implemented loan waiver schemes to provide temporary relief to farmers burdened by debt. These schemes involve writing off a portion of the outstanding agricultural loans, offering temporary moratoriums on loan repayments, and reducing interest rates.

Benefits

- **Immediate relief for farmers:** Loan waivers provide immediate financial relief to farmers struggling with debt, alleviating distress and potentially preventing loan defaults.
  - As per the **Reserve Bank of India,** NPAs were written off over ₹ 7 lakh crores due to loan waivers between 2017-18 and 2020-21, potentially benefiting millions of farmers.
- **Boosting agricultural production:** By reducing debt burden, loan waivers can incentivize farmers to invest in inputs and technology, leading to increased production and improved food security.
  - A 2019 study by the **National Bank for Agriculture and Rural Development (NABARD)** found a temporary 10% rise in production in some states after loan waivers.
- **Addressing market failures:** Loan waivers can address market failures that disadvantage farmers, such as volatile prices, unfair trade practices, and inadequate infrastructure.
  - For example, the **2008 farm loan waiver** was followed by investments in rural infrastructure and market reforms, leading to a temporary improvement in farmer income.
- **Social and political considerations:** Loan waivers can be seen as a necessary political intervention to address social unrest and maintain rural peace.

Limitations

- **Fiscal burden:** Loan waivers impose a significant burden on the government budget, diverting resources from other critical sectors like healthcare and education.
- **Moral hazard:** The availability of loan waivers can discourage farmers from repaying loans in the future, undermining credit discipline and bank stability.
  - The **RBI** data shows an increase in NPAs in the agricultural sector following loan waivers, suggesting a potential negative impact on credit culture.
- **Limited reach:** Loan waivers often fail to reach their intended beneficiaries due to complex eligibility criteria, bureaucratic hurdles, and corruption.
  - In 2022, the **NABARD report** found that only 50% of eligible farmers received the announced benefits under various farm loan waiver schemes, indicating their limited reach.
- **Unsustainable solution:** Loan waivers address the symptom (debt) but not the underlying causes of agricultural distress, such as climate change, inadequate market access, and fragmented landholdings.
  - The **Economic Survey of India 2022-23** acknowledges the short-term relief offered by loan waivers but highlights concerns about their long-term sustainability and potential negative impacts on credit discipline and government finances.

Way Forward

- **Focus on income support:** Instead of loan waivers, providing direct income support to farmers through schemes like PM-Kisan can offer a more targeted and sustainable approach.
- **Strengthening agricultural infrastructure:** Investing in

irrigation facilities, storage infrastructure, and market access can significantly enhance farmers' productivity and resilience.

- **Promoting crop diversification:** Encouraging farmers to diversify their crops and adopt risk mitigation strategies can reduce their vulnerability to market fluctuations and climate shocks.
- **Reforming credit institutions:** Making agricultural credit more accessible and affordable for farmers through reforms in lending practices and interest rates.
- **Policy-based loan restructuring:** Implementing flexible loan repayment options and debt restructuring mechanisms tailored to specific agricultural needs.
- **Long-term vision:** Addressing the root causes of agricultural distress through holistic policy interventions aimed at improving farm profitability, enhancing market access, and promoting sustainable agricultural practices.

ADDRESSING FARM DISTRESS: A SHIFT FROM LOAN WAIVERS TO INCOME SUPPORT

The rising tide of farm distress in India prompted the Government of India to launch the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme in 2019. This Central Sector Scheme provides a vital safety net, offering assured income support of 6,000 per year (disbursed in 3 instalments) to all landowning farmers withholdings up to 2 hectares. Initially targeted towards small and marginal farmers, the scheme's ambit was later expanded to encompass all landholders, regardless of size. This progressive move is estimated to benefit over 15 crore farmers nationwide.

However, PM-KISAN excludes affluent individuals, professionals, and pensioners to ensure targeted support reaches those most in need. Special provisions cater to the unique land ownership structures in the North-Eastern states and Jharkhand.

PM Kisan Samman Nidhi Yojana (PM-Kisan)

It is a central sector scheme launched by the Government of India in 2019 to provide income support to all eligible small and marginal farmer families across the country. The scheme aims to supplement the income of small and marginal farmers, who are often vulnerable to income fluctuations due to factors like weather conditions and market prices.

Key features of the scheme:

- **Financial support:** The scheme provides an annual income support of ₹ 6,000 per year to all eligible farmer families. This amount is paid in three equal instalments of ₹ 2,000 each, directly transferred to the bank accounts of the beneficiary farmers.
- **Eligibility:** All small and marginal farmer families owning cultivable land up to 2 hectares are eligible for the scheme. There is no requirement of minimum educational qualification or land ownership documents. Self-declaration of land ownership is sufficient for registration under the scheme.
- **Implementation:** The scheme is implemented through the Ministry of Agriculture and Farmers Welfare, in collaboration with state governments. Farmers can register themselves online or through Common Service Centres (CSCs) at the village level. Aadhaar authentication is mandatory for registration and for receiving the instalments.

Benefits of the scheme:

- **Financial stability:** The scheme offers much-needed financial support to small and marginal farmers, making them less vulnerable to income fluctuations due to weather or market uncertainties.
- **Improved livelihoods:** The annual income can help farmers meet basic needs and invest in agricultural inputs, potentially leading to increased productivity and farm income.
- **Rural economy boost:** The scheme can revitalise the rural economy by increasing purchasing power and demand for goods and services.
- **Agricultural growth:** Enhanced farmer income and investments can contribute to overall agricultural growth and development.

Challenges of the scheme:

- **Awareness and registration:** Ensuring all eligible farmers are aware of the scheme and can register remains a challenge.
- **Fake registrations:** Instances of fake and duplicate registrations can delay or hinder legitimate farmers from receiving benefits.
- **Land ownership documentation:** Clear land ownership documentation processes are crucial to ensure benefits reach genuine beneficiaries.

Conclusion

The PM Kisan Yojana is a significant step by the Government of India to support small and marginal farmers. The scheme has the potential to make a real difference in the lives of millions of farmers, helping them to improve their livelihoods and contribute to the growth of the agricultural sector.

Beyond The Central Scheme: State-Level Initiatives

Taking inspiration from PM-KISAN, several state governments have also implemented income or investment support schemes for farmers. These schemes can be broadly categorised as:

- **Independent schemes:** These operate alongside PM-KISAN, offering additional assistance. Examples include:
  - **Rythu Bandhu (Telangana):** Provides ₹ 4,000 per acre per season for investment in inputs like seeds and fertilisers.
  - **KALIA (Odisha):** Offers financial support to small and marginal farmers, landless agricultural households, and vulnerable cultivators.
  - **Krishak Bandhu (West Bengal):** Grants ₹ 10,000 per year as income support for two crops to all farmers, including landless ones.
- **Complementary schemes:** These build on PM-KISAN by topping up the central government's support. For instance:
  - **Rythu Bharosa (Andhra Pradesh):** Provides ₹ 13,500 income support (combining PM-KISAN and a state component) to farmers owning up to 5 acres.
  - **Mukhya Mantri Krishi Ashirwad Yojana (Jharkhand):** Offers a grant-in-aid of ₹ 5,000 per acre per year to farmers with arable land up to 5 acres.

A Move Away From Loan Waivers

The shift towards income/investment support schemes is lauded by the Reserve Bank of India, marking a departure from the earlier reliance on farm loan waivers. This approach is viewed as more sustainable and effective in addressing farm distress. In line with this shift, the RBI urges states to prioritise:

- **Digitization of land records:** Ensuring accurate and transparent data for targeted scheme implementation.
- **Linking with Aadhar-seeded bank accounts:** Facilitating efficient and error-free fund transfers to beneficiaries.

AGRICULTURAL STORAGE

"Within agricultural marketing, storage constitutes the process of retaining and safeguarding commodities from the moment they are required for consumption."

- A study by **National Academy of Agricultural Sciences (NAAS)** said storage is the major cause of post-harvest losses for all kinds of food in India, fruits and vegetables, where India faces a critical deficiency of cold storage capacity—this belies the enormous potential of its processed food industry.
- Around 70% of the total food grains production is retained and consumed at the farm level.
- The balance amount is supplied to the central pool and delivered at the nominated warehouse or at the local mandi earmarked for procurement.
- As of 2019, India has a total Agri warehousing capacity of around 91 million metric tonnes (MMT) with the majority of the capacity being owned by state agencies.
- State agencies own around 40% of the capacity and the balance distributed among private entrepreneurs, cooperative societies, farmers, etc.

Forms of Storages of Agricultural Produce

- **Warehouses:** The bedrock of storage infrastructure, warehouses provide ample space for stockpiling grains, pulses, and other non-perishables. Government agencies like the Food Corporation of India (FCI) and the Central Warehousing Corporation (CWC) operate extensive networks of warehouses across the nation, ensuring strategic reserves and market stability.
- **Cold Storage:** Perishables like fruits, vegetables, and dairy products demand a different approach. India boasts a robust network of cold storage facilities, equipped with temperature-controlled environments to prolong shelf life and minimize spoilage. The National Horticulture Board incentivizes the construction of new cold storage units through subsidies, recognizing their crucial role in preserving the value of these sensitive agricultural products.
- **Traditional Storage:** In rural areas, time-tested wisdom shines through in the form of traditional storage methods. Mud houses, underground pits, and bamboo baskets offer low-cost, effective solutions for storing grains and pulses. These age-old techniques continue to play a significant role in rural food security.
- **Grain Silos:** For large-scale storage of grains like wheat, rice, and corn, modern grain silos offer unmatched efficiency. The Food Corporation of India Silos Project spearheads the construction of these towering structures, equipped with automated systems for optimal temperature, humidity, and pest control.
- **Controlled Atmosphere Storage:** For select fruits like apples and pears, meticulous control over the storage environment is paramount. Controlled Atmosphere (CA) storage facilities meticulously regulate temperature, humidity, and oxygen levels, extending shelf life and preserving freshness for extended periods.
- **Food Parks:** Recognizing the need for integrated post-harvest infrastructure, the government has established food parks across the country. These parks house facilities for cold storage, warehousing, and food processing, creating a one-stop solution for minimizing post-harvest losses and adding value to agricultural produce.

Additional Storage Methods

- **Storage with cover:** FCI, CWC, and SWCs widely utilize this method, employing jute bags stacked in godowns for grain storage.
- **Cover and Plinth (CAP) Method:** Open storage with safeguards like rat-proof plinths and special polythene covers protects grains from moisture and pests.
- **Silo bags:** These innovative, hermetic storage solutions offer a temporary option for high-volume grain storage, shielding produce from various environmental elements.

India's Food Grain Storage Struggles: A Multifaceted Challenge

Storing India's vast harvest presents a complex set of difficulties, impacting both quantity and quality. Here are some key hurdles:

- **Infrastructure Gap:**
  - **Shortage at Farm Level:** Lack of storage facilities at farms exposes grains to pest and insect infestations, leading to significant losses.
  - **Imbalance in Capacity:** Existing storage facilities are concentrated in producing states, while consuming states face a deficit. This report from 2013 highlights how consuming states lacked sufficient space, with 64% of FCI storage located in production centers.
- **Subpar Quality Storage:**
  - **Uncontrolled Environment:** Godowns and warehouses often lack proper temperature and moisture control, causing grain quality deterioration, spoilage, and waste.
  - **Insecure Facilities:** Absence of secure storage makes grains vulnerable to mold and insect infestations. A 2013 CAG report cited unsafe and unscientific storage practices in Punjab and Haryana as a major cause of grain damage.
- **Overwhelmed Systems:**
  - **Inadequate Covered Storage:** During peak procurement seasons, the lack of Cover and Plinth storage facilities forces overstocked grains to be stored openly, exposing them to rain and flooding.
  - **Limited Plinth Space:** Insufficient plinth area allows water to seep from the ground, further damaging stored grains.

Need For Storage and Warehousing

- **Hunger and malnutrition:** India ranks 107 in the Global Hunger Index, 2022.
- Low Contribution of Agriculture to GDP approx, 18%.
- **Poor income of farmers:** Storage will help in earning export income.
- **Helps in checking inflation.**
- Due to high yield seeds, irrigation facilities, etc. there is an increase in the quantity of production.
- Storage ensures food security (Meeting SDG goal – 2).
- **Food Wastage:** India wastes food worth approximately $14 billion each year.
- **Paradox of Plenty:** The contrasting scenarios of record agricultural production and grinding poverty in the agriculture sector. According to the **Ministry of Consumer Affairs,** 62,000 tonnes of food grain was damaged in Food Corporation of India warehouses because of pests between 2011 and 2017.
- **Open Storage in mandis:** It is estimated that around 30 million tonnes of food grains are stored using open methods making grains vulnerable to fungus and moisture.
- **Administrative inefficiencies:** Lack of Computerisation and poor record maintenance.
- **Hoarding:** leading to inflation and market volatility.

Consequences of Poor Food Storage in India

India's bountiful agricultural harvests can turn into bitter losses if neglected during storage. Poor storage practices unleash a cascade of detrimental impacts, threatening not just the bottom line but also food security, health, and the environment. Let's delve into these consequences:

- **Economic Bite:**
  - **Spoilage and Infestation:** Unprotected crops become easy prey for pests and mold, leading to significant quantities rotting away. This translates to financial ruin for farmers, especially small-scale ones who lack resources for proper storage.
  - **Market Woes:** Poorly stored produce loses its quality, diminishing its market value and limiting farmers' ability to compete and profit.
- **Food Insecurity's Shadow:**
  - **Shrinking Stockpiles:** Post-harvest losses due to inadequate storage eat into India's food reserves, jeopardizing the vulnerable and exacerbating already existing food insecurity challenges.
  - **Malnutrition Threat:** Reduced supplies of essential nutrients due to spoilage can lead to malnutrition, particularly among children and vulnerable populations.
- **A Health Hazard Lurking:**
  - **Toxic Growth:** Unsanitary storage conditions encourage the growth of harmful bacteria and fungi, contaminating crops and making them unfit for consumption. This poses a serious health risk to consumers, potentially leading to foodborne illnesses.
- **Market Access Choked:**
  - **Perishables' Predicament:** Crops like fruits and vegetables, with their short shelf life, suffer greatly from poor storage. Without proper facilities, farmers lose the opportunity to reach distant markets, restricting their income potential.
- **Environmental Fallout:**
  - **Greenhouse Gas Guzzler:** Inefficient storage often necessitates unnecessary transportation and prolonged storage, increasing greenhouse gas emissions and contributing to climate change.
  - **Waste Woes:** Spoiled crops add to the burden on landfills and waste management systems, further straining limited resources.

Reforms Taken To Improve Storage Facilities

- **Decentralised Procurement Scheme:** To procure and store at the state level to avoid transit losses.
- **Negotiable Warehouse Receipt system:** Under this system, farmers can deposit their produce to the registered warehouses, and get a certain amount as advance from banks against their produce valued at MSP.
- **The essential commodities act:** ECA has been amended to relax stocking limits and thus encourage private and foreign investments in storage.
- **Agriculture Infrastructure Fund:** Setup for investment in viable projects for post-harvest management Infrastructure.
- **Storage and cold chain facilities:** Created under Pradhan Mantri Kisan Sampada Yojana (PMKSY)
- **'Village Storage Scheme' announced in Budget 2020:** Run by women's SHGs with the aim to provide holding capacity for farmers.

Emerging Trends in Agricultural Storage

Precision agriculture: Implementing sensor technology and digital monitoring systems within storage facilities allows for real-time data collection on temperature, humidity, and pest activity. This data can be used to optimize storage conditions and prevent losses.

Blockchain technology: Blockchain offers a secure and transparent platform for tracking the movement of agricultural produce from farm to table. This enhances traceability, builds consumer trust, and potentially improves

- **Implementing recommendations of Shanta Kumar committee:**
  - **Hand over Procurement to state:** The FCI should hand over procurement operations of wheat, paddy, and rice to states that have gained sufficient experience and infrastructure.
  - **Outsourcing:** FCI should outsource its stocking operations to various agencies such as Central Warehousing Corporation, State Warehousing Corporation, Private Sector under the Private Entrepreneur Guarantee (PEG) scheme.
  - FCI should act as an 'agency for innovations in the Food Management System'
- **Promoting open Market sale:** FCI conducts a weekly auction to conduct this scheme in the open market using the platform of commodity exchange NCDEX (National Commodity and Derivatives Exchange Limited).
- Inclusion of loans for constructing storage facilities (warehouses, market yards, godowns, and silos) under Priority Sector Lending (PSL) norms.
  - Introduction of the Private Entrepreneurs Guarantee Scheme to encourage private players in the construction of godowns.
- Implementation of the Negotiable Warehouse Receipt (NWR) system by the Warehousing Development and Regulatory Authority (WDRA), Government of India.
- Provision of subsidies for the construction of cold storage facilities.

Way Forward

- Modernization and up-gradation of Bulk Grain Handling Infrastructure. Government is inviting tenders under Design, Build, Fund, Own & Operate (DBFOT) to attract private investment into food storage and handling
- The private sector should be encouraged to build storage capacities in which they will store and maintain food grains procured by the Government agencies. Private Entrepreneurs Guarantee (PEG) Scheme formulated in 2008 in which storage capacity is created by private parties.
- Adequate manpower and supervision are required for scientific and safe storage.
- Timely and systematic evacuation planning can lead to the utilisation of vacant storage space.
- The intervention of state governments in identifying and handing over land for the construction of covered storage spaces.
- FCI reforms should be an urgent measure to address the issue of funding and scientific storage. Need to Implement Shanta Kumar committee recommendations.
- Increase accreditation of cold storage for the perishable commodities.
- Adopting technology such as GPS tracking and remote sensing to monitor food grain storage facilities and prevent losses.
- Rationalising buffer stocks by reducing excess stocks and maintaining only the necessary minimum levels.
- In addition to infrastructure and subsidy support, educating the farming community to form cooperatives and organise into larger bodies for constructing storage capacity in various production pockets."

Efficient agricultural storage is a strategic investment that paves the way for a more sustainable and resilient food system. By addressing the current challenges and capitalising on emerging trends, stakeholders can work together to create a future where farmers benefit from reduced losses, improved marketability, and enhanced income. This, in turn, will contribute to achieving global food security and ensuring greater prosperity for rural communities.

IGNITE YOUR MIND

Do you think the involvement of the private sector through schemes like the Private Entrepreneurs Guarantee Scheme is crucial for the modernization and expansion of agricultural storage facilities?

World's Largest Grain Storage Plan

Recognizing a critical need, the government launched the ambitious "World's Largest Grain Storage Plan in the Cooperative Sector" on May 31, 2023. This pilot project, currently underway in select states and UTs, aims to bolster food security and empower farmers through a multi-pronged approach.

The Key Pillars

- **PACS Empowerment:** The plan focuses on strengthening Primary Agricultural Credit Societies (PACS) by creating diverse agri-infrastructure at their level. This includes decentralized godowns, custom hiring centers, processing units, and even Fair Price Shops.
- **Confluence of Schemes:** Existing government initiatives like AIF, AMI, SMAM, and PMFME are strategically combined, providing PACS with access to subsidies, interest subventions, and financial support from NABARD at subsidized rates.
- **Multi-level Governance:** A robust structure ensures accountability and smooth implementation. An Inter-Ministerial Committee oversees scheme convergence, while National and State Level Coordination Committees guide the project's progress.

Benefits for Farmers

- **Storage Solutions:** PACS-level godowns minimize post-harvest losses and offer farmers secure storage options, preventing distress sales.
- **Improved Income:** Diversifying PACS activities creates new income streams for farmers, empowering them beyond crop sales.
- **Enhanced Market Access:** Integration with the food supply chain expands farmers' market reach, allowing them to fetch better prices.
- **Convenience and Savings:** PACS-based Fair Price Shops eliminate transportation costs and offer local access to essential goods.
- **Financial Security:** Bridge loans and MSP guarantees provide farmers with financial stability and bargaining power.

Overall Impact

- **Reduced Post-Harvest Loss:** Secure storage at PACS level significantly reduces food waste, leading to greater food security.
- **Empowered Farmers:** Diversified income sources, better market access, and financial security empower farmers and boost their livelihoods.
- **Strengthened Food Security:** Increased storage capacity at the village level bolsters food security across the country, benefiting both farmers and consumers.

The Pilot Project's success holds immense potential to revolutionise India's food storage landscape, empowering farmers, strengthening food security, and paving the way for a more prosperous agricultural future.

FOOD SECURITY

The Food and Agricultural Organization (FAO) states that food security emerges when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has three important and closely related components, which are :

- Availability of food
- Access to food
- Absorption of food

Current Status in India

According to the **Global Food Security Index 2022**, India has a prevalence of undernutrition of 16.3%. Further, 30.9% of children in India are stunted, 33.4% are underweight, and 3.8% are obese. India's Human Development Index is 0.65.

As per International Food Security Assessment, 2022–32, GFA-33 USDA, Economic Research Service, India, because of its population size, tends to influence food insecurity trends distinctly, estimated to 333.5 million or 65 percent of the food insecure population in 2022-23. By the next decade, the number of food-insecure people in India is projected to decrease to 24.7 million or 1.7 percent

Need of Food Security in India

Despite strides in food production and distribution, food security remains a critical concern in India. A complex interplay of factors contributes to this persistent issue, impacting millions of lives.

- **Poverty:** A considerable portion of India's population grapples with poverty, limiting their access to nutritious food. Low income and inadequate economic opportunities restrict purchasing power, hindering the ability to afford sufficient and diverse diets.
- **Unequal Distribution:** Even though India produces enough food to feed its inhabitants, the distribution network suffers from significant inequities. Food often bypasses vulnerable populations, leading to localised shortages and disparities in access.
- **Price Volatility:** Essential food commodities like rice and wheat are susceptible to price fluctuations. Inflationary periods can render these staples unaffordable for many, exacerbating food insecurity.
- **Agricultural Challenges:** India's agricultural sector faces several obstacles, including:
  - **Unpredictable weather patterns:** Droughts, floods, and erratic rainfall can devastate crops and disrupt food production.
  - **Water scarcity:** Limited access to water for irrigation restricts agricultural productivity, particularly in arid regions.

- **Soil degradation:** Unsustainable farming practices and overuse of fertilisers can deplete soil fertility, impacting crop yields.
- **Inadequate infrastructure:** Lack of proper storage facilities, transportation networks, and market access can lead to post-harvest losses and inefficiencies in the food supply chain.

- **Land Ownership:** Unequal land distribution patterns disadvantage small-scale farmers. Limited landholding restricts their ability to produce sufficient food for their families and communities.
- **Food Wastage:** A significant portion of food is lost or wasted during production, storage, and distribution. Inefficient practices and inadequate infrastructure contribute to this issue, further straining food availability.
- **Malnutrition:** Food insecurity is often intertwined with malnutrition. Even when food is available, it may lack essential nutrients, leading to deficiencies and health problems, particularly among children.
- **Urbanisation:** Rapid urbanisation has led to dietary shifts, with increased reliance on processed and less nutritious foods. This can contribute to "hidden hunger," where people consume enough calories but lack essential micronutrients.
- **Natural Disasters:** India's vulnerability to natural disasters like droughts, floods, and cyclones poses a constant threat to food security. These events can disrupt agricultural production, destroy crops, and exacerbate food shortages in affected areas.
- **COVID-19 Pandemic:** The pandemic further amplified food insecurity challenges. Lockdowns disrupted supply chains, impacted livelihoods, and increased the vulnerability of marginalised populations to food shortages.

MEASURES TAKEN TO PROMOTE FOOD SECURITY IN INDIA

1. The National Food Security Act, 2013

The National Food Security Act (NFSA) 2013, a landmark legislation enacted by the Government of India, aims to ensure food security and nutritional rights for all citizens. It replaced the existing food grain distribution system with a more rights-based approach, guaranteeing subsidised food grains to a significant portion of the population. It is a legal entitlement that guarantees subsidised food grains to approximately 81.34 crore (813.4 million) people across the country, representing two-thirds of the rural population and half of the urban population.

Key Features of NFSA

- **Right to Food:** The Act recognizes the right to food as a fundamental right and legally entitled up to 75% of the rural population and 50% of the urban population to subsidised food grains.
- **Eligibility:** The Act defines eligible households based on exclusion criteria, ensuring coverage for the most vulnerable sections of society.
- **Entitlements:** Eligible households are entitled to receive subsidised rice, wheat, and coarse grains at predetermined prices. The quantity varies depending on the category (Antyodaya, Priority, General).
- **Targeted Public Distribution System (TPDS):** The Act strengthens the TPDS, a network of Fair Price Shops (FPS) through which subsidised food grains are distributed.
- **Transparency and Accountability:** The Act mandates transparency in procurement, storage, and distribution of food grains, aiming to reduce leakages and corruption.

Key Schemes under NFSA

- **Antyodaya Anna Yojana (AAY):** Provides 35 kg of rice or wheat per month at highly subsidised rates to the poorest households identified under the AAY category.
- **Priority households:** Up to 75% of the rural population and 50% of the urban population are classified as priority households. These households are entitled to 5 kg of rice or wheat per person per month at subsidised rates.
  - Eligible households above the poverty line receive 15 kg of food grains per month at subsidised rates.
- **General category:** Open market sale of food grains at non-subsidized prices for individuals not covered under AAY or priority categories.

Challenges

- **Fiscal Burden:** The substantial cost of NFSA, exceeding ₹ 1.2 lakh crore annually, poses a significant challenge to government finances.
  - The **Economic Survey of India 2022-23** acknowledges NFSA's role in reducing food insecurity but raises concerns about its fiscal burden and potential for leakages and corruption.
    - The Government of India spends over ₹ **1.2 lakh crore** annually on the implementation of NFSA.
- **Implementation Gaps: I**nefficient supply chains, lack of transparency, and bureaucratic hurdles hinder effective implementation.
  - According to a 2022 report by the **National Bank for Agriculture and Rural Development (NABARD)**, only 50% of eligible farmers received the intended benefits under various farm loan waiver schemes implemented alongside NFSA, highlighting implementation gaps and limited reach.
- **Exclusion of Eligible Beneficiaries:** Outdated data and inadequate awareness may exclude deserving households.
- **Nutritional Quality and Diversity:** The focus on staple food grains may neglect other essential nutrients.

Measures for Improvement

- The **National Institute of Rural Development (NIRD)** and the **World Bank** have published reports highlighting the achievements and limitations of NFSA, emphasising the need for reforms.
- **Digitization and transparency:** Implementing digitization in the PDS system can enhance transparency, reduce leakages, and improve targeting of eligible beneficiaries.
- **Direct benefit transfers:** Exploring alternative mechanisms like direct benefit transfers for food subsidies can potentially streamline the program and reduce administrative costs.
- **Strengthening grievance redressal mechanisms:** Establishing robust grievance redressal mechanisms can empower beneficiaries to address issues related to exclusion, corruption, and inadequate food quality.
- **Focus on nutrition:** Integrating nutrition education and promoting diverse food choices within the PDS can contribute to improved dietary patterns and overall health outcomes.
- **Regular monitoring and evaluation:** Conducting regular monitoring and evaluation of NFSA implementation is crucial for identifying weaknesses and making necessary adjustments for continuous improvement.

2. PM Garib Kalyan Anna Yojana (PMGKAY)

PM Garib Kalyan Anna Yojana (PM-GKAY), started during difficult time of COVID-19 crisis, has provided food security to the poor, needy and the vulnerable households/beneficiaries so that they do not suffer on account of non-availability of adequate foodgrains. The scheme was initially launched for three months, but was later extended several times.

The Cabinet led by Prime Minister has decided that the Central government will provide free food grains to about 81.35 crore beneficiaries under the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) for a period of five years with effect from 1st January, 2024.

Benefits: Under the PMGKAY, each eligible household receives **5 kg of rice or wheat per person per month**, over and above the regular monthly NFSA foodgrains.

Eligibility: The scheme is open to **all the priority households** under the **National Food Security Act (NFSA**), which includes:

- Antyodaya Anna Yojana (AAY) beneficiaries,
- Eligible households under the Priority Household (PHH) category,
- Non-AAY eligible households.

The PMGKAY has been a lifeline for millions of poor and vulnerable people in India. The scheme has helped to ensure that they have access to adequate food, even during the COVID-19 pandemic.

Key Features of PMGKAY

- **Free food grains:** The scheme provides free food grains to eligible households under the NFSA.
- **Targeted beneficiaries:** The scheme is open to all the priority households under the NFSA, including AAY beneficiaries, PHH beneficiaries, and non-AAY eligible households.

3. One Nation One Ration Card

About Scheme

The ONORC scheme is being implemented by the Department of Food And Public Distribution,Ministry Of Consumer Affairs, for the nationwide portability of ration cards under National Food Security Act (NFSA). Through this all eligible ration card holders/beneficiaries covered under NFSA can access their entitlements from anywhere in the country.

Under this plan, the distribution of highly subsidised food grains is enabled through nationwide portability of ration cards through the implementation of IT-driven system by installation of ePoS devices at FPSs, seeding of Aadhaar number of beneficiaries with their ration cards and operationalization of biometrically authenticated ePoS transactions in the State/UTs.

Applied by

- Beneficiaries can quote either their ration card number or the Aadhaar number to any Fair Price Shop's dealer across the country.
- Anyone in the family, who have seeded Aadhaar in the ration card can undergo authentication and lift the ration.
- There is no need to share or carry the ration card or Aadhaar card with ration dealers to avail of the benefit.

Mode authentication: Beneficiaries can undergo Aadhaar authentication by using their fingerprints or iris based identification.

Eligibility

It provides an option to all eligible ration cardholders or beneficiaries covered under the National Food Security Act (NFSA), 2013

Benefits

- The system also allows their family members back home, if any, to claim the balance foodgrains on same the ration card
- Apart from this, ONORC will also give the beneficiaries the opportunity to choose their own dealer. With many cases of misallocation, the beneficiary can switch to another FPS shop instantly, if there is any case of foul play.

4. Integrated Child Development Services (ICDS) Scheme

Launched on 2nd October 1975, today, ICDS Scheme represents one of the world's largest and most unique programmes for early childhood development. ICDS is the foremost symbol of India's commitment to her children – India's response to the challenge of providing pre-school education on one hand and breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality, on the other.

Objectives

1. To improve the nutritional and health status of children in the age-group 0-6 years;
2. To lay the foundation for proper psychological, physical and social development of the child;
3. To reduce the incidence of mortality, morbidity, malnutrition and school dropout;
4. To achieve effective coordination of policy and implementation amongst the various departments to promote child development; and
5. To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

Services

1. Supplementary nutrition,
2. Immunisation,
3. Health check-up,
4. Referral services,
5. Pre-school non-formal education and
6. Nutrition & health education.

The concept of providing a package of services is based primarily on the consideration that the overall impact will be much larger if the different services develop in an integrated manner as the efficacy of a particular service depends upon the support it receives from related services.

Services	Target Group	Service Provided by
Supplementary Nutrition	Children below 6 years & Pregnant & Lactating Mother (P&LM)	Anganwadi Worker and Anganwadi Helper
Immunization*	Children below 6 years & Pregnant & Lactating Mother (P&LM)	ANM/MO
Health Check-up*	Children below 6 years & Pregnant & Lactating Mother (P&LM)	ANM/MO/AWW
Referral Services	Children below 6 years & Pregnant & Lactating Mother (P&LM)	AWW/ANM/MO
Pre-School Education	Children 3-6 years	AWW
Nutrition & Health Education	Women (15-45 years)	AWW/ANM/MO

*AWW assists ANM in identifying the target group.

5. Food Fortification

- Food fortification aims to improve the nutritional value of commonly consumed foods by adding essential vitamins and minerals. It is a cost-effective and sustainable approach to address micronutrient deficiencies in large populations.
- Fortified foods often include staples like rice, wheat flour, salt, cooking oil, and milk, as they are widely consumed across the country. The process involves adding precise amounts of nutrients that are typically lacking in the diet, ensuring they reach those who need them most.
- In October 2016, FSSAI operationalized the Food Safety and Standards (Fortification of Foods) Regulations, 2016 for fortifying staples namely Wheat Flour and Rice (with Iron, Vitamin B12 and Folic Acid), Milk and Edible Oil (with Vitamins A and D) and Double Fortified Salt (with Iodine and Iron) to reduce the high burden of micronutrient malnutrition in India.
- The '+F' logo has been notified to identify fortified foods. Food Safety and Standards (Fortification of Foods) Regulations, 2018 were notified in the Gazette of India on 09.08.2018.
- Food fortification in India has had a profound impact on public health by addressing nutrient deficiencies.
- One major success is the improvement in micronutrient intake, as seen in the reduction of iodine deficiency disorders through the fortification of salt with iodine. Additionally, fortification of staple foods like wheat flour with iron and folic acid has led to decreased rates of anemia, particularly among women and children.
- This has significantly contributed to enhancing maternal and child health, a critical area where nutrient deficiencies can have severe consequences.
- Fortified foods have proven instrumental in combating hidden hunger, where essential micronutrients are lacking despite sufficient caloric intake.
- Staples like rice, wheat flour, and milk, when fortified, provide a consistent source of nutrients, promoting overall health and reducing the risk of deficiencies.
- Furthermore, food fortification is praised for being an economical and scalable solution, utilizing existing food supply chains and remaining accessible to both rural and urban populations.
- The affordability and minimal impact on dietary patterns make it an effective strategy for addressing malnutrition across diverse socioeconomic groups.

6. Saksham Anganwadi and Poshan 2.0 (Mission Poshan 2.0)

It includes key schemes such as the POSHAN Abhiyaan, Anganwadi Services and Scheme for Adolescent Girls as direct targeted interventions to address the problem of

malnutrition in the country. The beneficiaries under the Anganwadi Services scheme are children in the age group of 0-6 years, pregnant women and lactating mothers. Supplementary nutrition is provided to beneficiaries in the form of Hot Cooked Meals at Anganwadi Centres and Take Home Ration (not raw ration).

Mission Poshan 2.0 represents a significant paradigm shift in India's fight against malnutrition. Recognizing the multifaceted nature of this challenge, the mission goes beyond simply providing food. It aims to transform the entire nutritional ecosystem by focusing on:

- **Enhanced Nutritional Content:** Stringent quality control measures and testing in accredited labs ensure delivery of nutrient-rich food across the program.
- **Efficient Delivery Systems:** The "Poshan Tracker" app empowers real-time monitoring and management of services, facilitating prompt interventions and better resource allocation.
- **Convergent Ecosystem for Well-being:** The program fosters a holistic approach, promoting practices and behaviours that nurture health, wellness, and immunity within communities.

Dietary Diversification: Building a Plate of Abundance

Mission Poshan 2.0 champions dietary diversification as a key pillar for sustainable health. This translates into:

- **Promoting Consumption of Micronutrient Rich Foods:** Anganwadi centres actively encourage the inclusion of dark green leafy vegetables, lentils, and vitamin C-rich fruits in daily meals, ensuring a diverse intake of essential nutrients.
- **Combating Micronutrient Deficiencies:** Recognizing the widespread prevalence of iron, folic acid, and vitamin B-12 deficiencies, particularly in women and children, the program has adopted a two-pronged approach:
  - **Fortified Rice:** Since FY 2021-22, fortified rice has been progressively rolled out across all states and union territories, ensuring a readily accessible source of these crucial micronutrients.
  - **Millet Integration**: Recognizing the immense nutritional potential of millets, the program mandates their inclusion in Take Home Rations and Hot Cooked Meals at least once a week. This not only diversifies diets but also taps into a traditionally underutilised yet highly nutritious food source.

Poshan Abhiyaan, a vital component of Mission Poshan 2.0, focuses on driving social and behavioural change (SBCC) through a mass movement called "Jan Andolan." This movement aims to:

- **Address Inadequate Feeding Practices:** BCC campaigns actively tackle improper infant and young child feeding practices, promoting optimal nutrition during pregnancy and adolescence.
- **Community-Based Learning:** Monthly Community Based Events (CBEs) serve as platforms for education and counselling, focusing on maternal health, breastfeeding techniques, and timely introduction of complementary feeding.
- **Jan Andolans:** Raising Awareness and Inspiring Action: National campaigns like Rashtriya Poshan Maah and Poshan Pakhwada raise public awareness on critical issues like maternal health, breastfeeding practices, and the importance of traditional foods for women and children.

PUBLIC DISTRIBUTION SYSTEM (PDS)

The Public Distribution System (PDS) is one of the largest and most ambitious food security programs in the world, serving millions of Indians across the country. It was established in 1960s, and it is one of the largest and oldest welfare programs in the world, providing subsidised food grains to millions of households below and above the poverty line.

Objectives of The PDS

- **To ensure food security:** The PDS aims to provide subsidised food grains to the most vulnerable sections of the population, including below poverty line (BPL) households, Antyodaya Anna Yojana (AAY) families, and other vulnerable groups.
- **To stabilise prices:** By regulating the supply and demand of food grains, the PDS aims to stabilise prices and prevent food inflation, particularly during periods of scarcity.
- **To promote social welfare:** The PDS plays a crucial role in alleviating poverty and improving nutritional outcomes, particularly for children and pregnant women.
- **Poverty alleviation:** Supplement the income of poor households and contribute to poverty reduction.

Functioning of The Public Distribution System

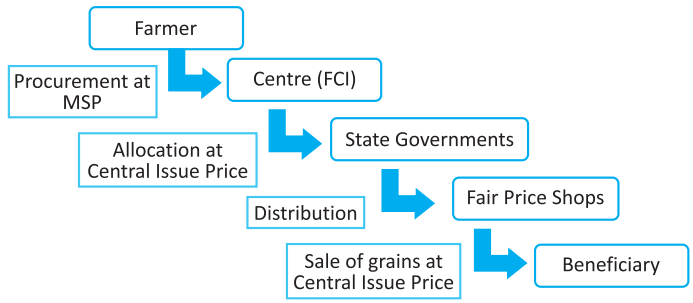


Fig. 14.6: Functioning of the PDS

Key Components of the PDS

- **Central Government:** Responsible for procurement, storage, and transportation of food grains through the Food Corporation of India (FCI).

- **State Governments:** Implement the PDS through a network of Fair Price Shops (FPS) across the country.
- **Beneficiaries:** Eligible households receive subsidised food grains at designated FPS, typically rice, wheat, and sugar, at significantly lower prices than market rates.

Current Data

- **Beneficiaries:** As of 2023, over 80.10 crore Indians are covered under the PDS, representing approximately 67% of the population.
- **Cost:** The PDS incurs a significant cost on the government, exceeding ₹ 1.5 lakh crore annually.

Significance

- **Large coverage:** The PDS covers over 800 million people through a network of over 5.38 lakh Fair Price Shops (FPS) across the country.
- **Grain buffer:** The government maintains a buffer stock of essential food grains to ensure uninterrupted supply even during droughts or other natural disasters.
- **Price stability:** The PDS helps to stabilise food prices, particularly during times of inflation or market fluctuations.
- **Rural development:** The PDS provides income support to farmers through procurement of their produce at Minimum Support Prices (MSP).
- A recent report by the National Institute of Rural Development (NIRD) found that the PDS has been successful in reducing poverty and improving food security in rural areas.

Revamped Public Distribution System (RPDS)

- Launched in 1992, the Revamped Public Distribution System (RPDS) aimed to streamline and strengthen the existing PDS. The primary goal was to enhance the reach of the PDS in far-flung, hilly, remote, and inaccessible areas, specifically targeting the poorer sections residing in these regions.

Targeted Public Distribution System (TPDS)

- In response to the shortcomings identified in the PDS, the central government introduced the Targeted Public Distribution System (TPDS) in 1997. This scheme was designed as a pro-poor initiative, focusing on providing assistance to the poor across all areas. TPDS categorized the entire population into two groups: Below Poverty Line (BPL) and Above Poverty Line (APL).
- Later, in 2001, the Antyodaya Anna Yojana (AAY) category was introduced, specifically for the 'poorest of the poor.' This addition aimed to address pricing issues for the BPL population with an annual income below ~15,000. Initially, each BPL household received 10 kg of food grains, which was later increased to 35 kg per household per month starting from April 1, 2002.
- The Central Issue Prices (CIPs) for APL were fixed at 100 percent of the economic cost, while for BPL, they were set at 50 percent of the economic cost.

Reports and Committee Recommendations

- **Rangarajan Committee Report (2014):** Advocated for targeted delivery and technological interventions to improve efficiency.
- **The Doodh Dharia Committee (2014)** recommended reforms like digitization, rationalisation of eligibility criteria, and direct benefit transfers to improve the PDS.
- **Economic Survey of India 2022-23:** Acknowledges the important role of PDS in ensuring food security but calls for reforms to address inefficiencies and fiscal burden.

Case Studies

- **Gujarat PDS reform:** Successfully implemented PDS reforms through digitization and biometric authentication, reducing leakages and improving efficiency.
- **Kerala PDS model:** Recognized for its focus on community participation and women-led management, leading to better targeting and outreach.

Challenges and Issues

1. **Targeting Errors:** Accurate identification of beneficiaries is a hurdle. The BPL/APL classification suffers from rampant exclusion and inclusion errors due to outdated and unreliable data. Experts estimate 61% of eligible families missing from BPL lists, while 25% of non-poor households getting undue benefits. "Ghost cards" further exacerbate the problem, syphoning off grains meant for the needy.
2. **Storage Shortfall:** The Food Corporation of India (FCI) struggles with inadequate storage capacity. Despite a sharp rise in grain procurement, FCI storage (both owned and rented) hasn't kept pace, leading to potential spoilage and inefficiency.
3. **Rising Burdens:** The central government shoulders a hefty financial burden due to the PDS. Procuring and distributing food grains costs six times the selling price, resulting in a massive food subsidy expected to escalate further under the National Food Security Act.
4. **Inconsistent Quality:** Recipients often complain about irregular grain quality, with poor wheat a frequent gripe. This raises concerns about nutritional effectiveness and potentially discourages participation in the system.
5. **Corruption and Leakages:** Despite attempts at reform, leakages and corruption remain pervasive. Shopkeepers swapping government-supplied grains for lower-quality ones and diverting commodities to the open market for higher prices are just some examples.

6. **Opaque Dealer Selection:** The lack of transparency in selecting PDS dealers raises concerns about fairness and potential manipulation.

PDS Reforms

The Public Distribution System (PDS) plays a crucial role in India's food security, but its effectiveness is hampered by inefficiencies and leakages. To ensure it lives up to its potential, comprehensive reform is urgently needed. Fortunately, various states are leading the charge with innovative approaches:

Digital Armor

- **Aadhaar-linked, digitised ration cards:** Online data entry and verification, coupled with tracking of entitlements and grain distribution, bring transparency and accountability.
- **Computerised Fair Price Shops:** Point-of-sale systems at FPS authenticate beneficiaries and record grain disbursement, minimising human error and potential manipulation.
- **Direct Benefit Transfer (DBT):** Replacing the direct grain subsidy with cash transfers empowers beneficiaries to choose food grains from any market. This digitization-dependent model can potentially save the government ₹ 30,000 crore annually.

Tech on Guard

- **GPS-tracked grain transport:** Monitoring trucks carrying food grains with GPS technology reduces the risk of diversion and ensures intended delivery.
- **SMS-based vigilance:** Citizen involvement through SMS alerts for commodity dispatch and arrival fosters transparency and encourages public oversight.
- **Web-based grievance portal:** Toll-free call centres and online platforms provide avenues for complaints and suggestions, enabling swift redressal of issues.

Looking Ahead

In addition to these state-driven reforms, national initiatives like:

- **PDS computerization:** Streamlining record-keeping and data management at various levels.
- **Aadhaar-based authentication:** Enhancing beneficiary identification and reducing duplicate entries.
- **"One Nation, One Ration Card" program:** Empowering beneficiaries to access their PDS entitlements across the country, regardless of their home state.

These transformative steps paint a promising picture for the future of PDS. By plugging the leaks through digitization, technological vigilance, and citizen engagement, the system can effectively deliver its intended benefits to those who need it most, contributing to a healthier and more food-secure India.

SMART PDS (Scheme for Modernisation and Reforms through Technology in Public Distribution System)

SMART PDS is an initiative launched by the Indian government to improve the efficiency, transparency, and accountability of the Targeted Public Distribution System (TPDS). TPDS is a nationwide program that provides subsidised food grains to millions of eligible households below the poverty line.

Objectives

- **Prevent diversion of food grains:** By leveraging technology, SMART PDS aims to reduce leakages and pilferage of food grains, ensuring that the intended beneficiaries receive their due share of food subsidies.
- **Enhance efficiency in the distribution chain:** The initiative focuses on streamlining the supply chain from procurement to distribution by incorporating technology-driven solutions, such as:
- **Improve targeting:** SMART PDS aims to improve the targeting of food subsidies by ensuring that only eligible households benefit from the scheme. This is achieved through activities like data cleaning and updating, and verification of beneficiary information.
- **Increase portability:** Under SMART PDS, beneficiaries can access their entitled food grains from any FPS across the country, provided they have a valid ration card. This is a significant improvement from the earlier system, where beneficiaries were restricted to specific FPSs.

Key Features

- **Aadhaar Authentication and ePoS Devices**
  - **Biometric Verification:** Beneficiaries are authenticated using their Aadhaar fingerprints at Fair Price Shops (FPS) using electronic Point of Sale (ePoS) devices. This ensures only eligible individuals receive subsidised food grains.
  - **Electronic Point of Sale (ePoS) devices:** These devices are used at Fair Price Shops (FPS) to record the distribution of food grains to beneficiaries.
  - **Real-time Data Capture:** ePoS devices capture real-time transaction data, including the quantity of food grains distributed, beneficiary details, and the date/time of the transaction. This data is uploaded to a central server, enabling real-time monitoring and analysis.
- **Digitization of Ration Cards**
  - **Eliminating Duplication and Errors:** Paper ration cards are prone to errors, duplication, and fake entries. SMART PDS involves digitising ration cards with unique IDs, eliminating these issues and ensuring accurate beneficiary identification.
  - **Portability:** With digitised ration cards, beneficiaries can access their entitled food grains from any FPS across the country, providing greater flexibility and convenience, especially for migrant workers.

- **Real-time Monitoring and Tracking**
  - **End-to-End Visibility:** The movement of food grains from warehouses to FPSs is tracked in real-time using a web-based monitoring system. This allows for identification of bottlenecks, prevention of leakages, and efficient resource allocation.
  - **Transparency and Accountability:** Real-time data helps identify discrepancies and hold stakeholders accountable for efficient PDS implementation.
- **Mobile App for Beneficiaries:**
  - **Information Access:** Beneficiaries can access information about their entitlements, nearby FPSs, and food grain availability through a dedicated mobile app. This empowers them to track their rations and exercise greater control over their entitlements.
  - **Grievance Redressal:** The app provides a platform for beneficiaries to raise grievances related to the PDS system, enabling timely resolution of issues.
- **Data Analytics and Reporting:**
  - **Informed Decision-making:** Data collected through SMART PDS is analysed to identify trends, patterns, and areas for improvement. This data-driven approach helps policymakers make informed decisions for targeted interventions and effective scheme implementation.
  - **Performance Evaluation:** Regular reports are generated based on data analysis, which allows for continuous monitoring of the scheme's performance and identification of areas requiring further attention.

Overall, SMART PDS is a significant step towards reforming the TPDS and ensuring that food subsidies reach the intended beneficiaries. The initiative has achieved considerable success in reducing leakages and improving efficiency, but there are still challenges that need to be addressed. With continued efforts, SMART PDS has the potential to significantly improve food security in India.

IGNITE YOUR MIND

Despite being one of the world's largest food security programs, the Public Distribution System (PDS) faces significant challenges like targeting errors, leakages, and rising costs. Do you think the focus should shift towards direct benefit transfers or should PDS reforms like digitization and technological interventions be prioritized?

Food Corporation of India

The Food Corporation of India (FCI) plays a crucial role in ensuring food security in India through procurement, storage, and distribution of food grains. It was established in 1965 under the **Food Corporations Act of 1964** and has significantly contributed to food security and price stabilisation in the country. It procures food grains at minimum support prices (MSP) announced by the government to protect farmers' income and ensure sufficient buffer stocks.

Objectives

- Effective price support operations for safeguarding the interests of the farmers.
- Distribution of food grains throughout the country for Public Distribution System;
- Maintaining a satisfactory level of operational buffer stocks of food grains to ensure National Food Security.

Methods

FCI currently procures wheat and paddy through two main methods:

- **Levy:** States levy a fixed percentage of the produce from farmers at the MSP.
- **Direct Purchase:** FCI purchases grains directly from farmers at designated mandis at the MSP.

Current Data

In 2022-23, FCI procured a record 433.44 lakh tonnes of food grains, exceeding its target.

Rice accounts for the majority of procurement, followed by wheat.

Issues related to Procurement and Storage by FCI

- **Open-ended Procurement:** FCI buys as many grains as the farmers can sell. It not only stretches the already overburdened godowns but also collapses the food grains market.
- **Market Distortion:** Through its policy of open-ended procurement.
- **Imbalances in storage facilities:** According to the **CAG report,** out of the total storage space, 64% was located in the large procurement states like Punjab, Haryana, Andhra Pradesh, Uttar Pradesh, and Chhattisgarh.
- **Inadequate storage facility:** The existing storage facility is poorly maintained causing grain damage due to pest attacks.
- **Lack of scientific storage mechanism:** FCI still uses gunny bags for storing food grains instead of canisters or metal containers.
- **Poor pest management:** Modern Sanitary and Phytosanitary Measures for exports require sophistication in pest management which is absent.
- **Non-adherence to the First in First out principle (FIFO):** The CAG report has mentioned that food grains harvested in later dates are despatched for PDS consumption but still grains procured in earlier dates are stored in warehouses
- **Transit losses:** Around 411,810 tonnes of wheat and rice were wasted as transit and pilferage losses in the past four years.

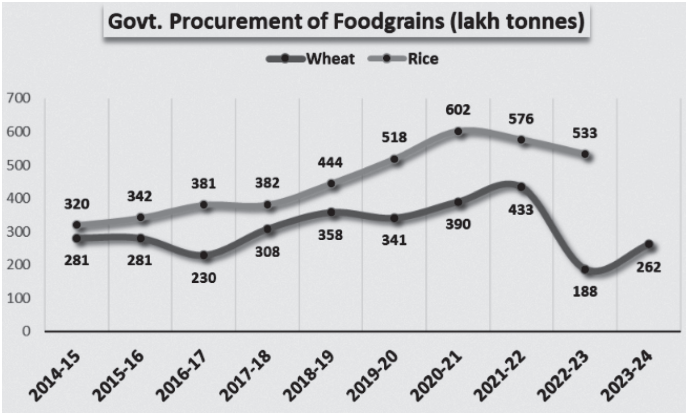


Fig. 14.7: Quantity of food grain procurement by the Government

Challenges

- **High Procurement Costs:** The MSP mechanism and the burden of surplus grains lead to a significant financial burden on the government.
  - While the distribution price of foodgrains under the National Food Security Act (NFSA), 2013 has remained the same at ₹ 2-3/kg, the assured minimum support price (MSP) at which FCI procures wheat and rice from farmers for distribution has skyrocketed.
- **Storage and Distribution:** FCI faces challenges in managing its vast network of storage facilities and ensuring efficient distribution across the country.
  - Food grains are getting rotten at storage facilities and have negligible pest control mechanisms.
- **Leakages and Corruption:** The PDS system suffers from leakages and corruption, leading to diversion of subsidised food grains from intended beneficiaries.
- **Operational Inefficiencies:** FCI's operations are often criticised for being bureaucratic and inefficient, leading to delays and higher costs.

Role of FCI in Various Programs

- **PDS/TPDS:** FCI supplies food grains to states at subsidised rates for distribution through the PDS and TPDS to ensure food availability for vulnerable populations.
- **AAY:** FCI provides subsidised food grains to the poorest and most vulnerable households identified under the AAY.
- **NFSA:** Under NFSA, FCI supplies food grains to states at subsidised rates for distribution to entitled beneficiaries at designated fair price shops.

FCI plays a vital role in ensuring food security in India. However, addressing the challenges related to procurement costs, storage, leakages, and operational efficiency is crucial. Additionally, implementing reforms suggested by various committees and promoting technology adoption can improve FCI's effectiveness and enhance its contribution to food security programs.

Operational Stock

Operational Stocks refer to the minimum quantities required to sustain the Targeted Public Distribution System (TPDS)/National Food Security Act (NFSA) and other welfare schemes until the procurement of quantities from the new crop. These stocks are derived from the current year's production and are intended for consumption in the following year. In managing Operational Stocks, adjustments are made for intra-year variations, ensuring stability. For buffer stocks, considerations extend to inter-year variations.

Buffer Stock

Buffer stocks are quantities of grains maintained by the Food Corporation of India (FCI) beyond the operational needs. These stocks are categorised as strategic stocks. The government establishes buffer stock norms, specifying the minimum quantities of food grains (wheat and rice) to be held in the central pool at the beginning of each quarter. Buffer stocks play a crucial role in ensuring stability and readiness for unforeseen circumstances in the food supply chain.

Shanta Kumar Committee Recommendations

The Shanta Kumar Committee, officially known as the High Level Committee on Restructuring of Food Corporation of India (FCI), was established in 2014 by the Government of India to analyse and recommend restructuring options for FCI to improve its operational efficiency and financial management.

Key Recommendations

1. **Procurement Reforms:**
   - **Handing over procurement operations:** The committee recommended that FCI hand over all procurement operations of wheat, paddy, and rice to states that have demonstrated sufficient experience and infrastructure for the task. This aims to reduce FCI's operational costs and increase efficiency.
   - **Rationalising MSP:** The committee suggested revisiting the MSP policy to ensure its sustainability and prevent the accumulation of excess stocks.
2. **Storage and Distribution Reforms:**
   - **Modernising storage infrastructure:** The committee recommended modernising FCI's storage infrastructure to reduce losses and improve quality control.
   - **Public-private partnerships:** The committee suggested exploring public-private partnerships (PPPs) for storage and distribution operations to leverage private sector expertise and improve efficiency.

- **Strengthening PDS:** The committee emphasised the need to strengthen the Public Distribution System (PDS) to ensure targeted delivery of subsidised food grains and reduce leakages.

3. **Financial Reforms:**
   - **Restructuring FCI:** The committee recommended restructuring FCI into separate entities for procurement, storage, and distribution to improve financial management and accountability.
   - **Targeted subsidies:** The committee advocated for targeted delivery of food subsidies to reduce the fiscal burden on the government and ensure efficient utilisation of resources.

Potential Impact

- **Reduced costs and improved efficiency:** Implementing the recommendations could significantly reduce FCI's operational costs and improve its overall efficiency.
- **Increased farmer incomes:** Handing over procurement to states could provide farmers with better access to markets and potentially lead to higher prices.
- **Reduced food losses:** Modernising storage infrastructure could minimise post-harvest losses and ensure better quality food grains reach consumers.
- **Improved PDS targeting:** Targeted delivery of subsidies could ensure that food grains reach the intended beneficiaries and address concerns about leakages.
- **Enhanced financial sustainability:** Restructuring FCI and implementing targeted subsidies could improve its financial sustainability and reduce the government's fiscal burden.

Challenges and Considerations

- **Implementation complexities:** Implementing the recommendations could be challenging due to bureaucratic hurdles, political considerations, and potential resistance from stakeholders.
- **Inter-state coordination:** Effective inter-state coordination is crucial for successful implementation, particularly regarding procurement and distribution.
- **Impact on farmers:** Transitioning procurement operations to states requires careful planning and consideration to ensure farmers' interests are protected and they continue receiving fair prices for their produce.
- **Long-term sustainability:** The long-term sustainability of the proposed reforms requires continuous monitoring, evaluation, and adjustments to adapt to changing circumstances.

AGRICULTURE EXPORTS

Background

India, with a large and diverse agriculture, is among the world's leading producers of cereals, milk, sugar, fruits and vegetables, spices, eggs and seafood products. Indian agriculture continues to be the backbone of our society and it provides livelihood to nearly 50 percent of our population. India is supporting 17.84 percent of the world's population, 15% of the livestock population with merely 2.4 percent of world's land and 4 percent water resources. Hence, continuous innovation and efforts towards productivity, pre & post-harvest management, processing and value-addition, use of technology and infrastructure creation is an imperative for Indian agriculture.

Statistics of Agriculture Exports

- Starting with a mere USD 0.6 billion export in 1987-88, now the export of agricultural products has reached a new height of USD 19.69 billion till April-December 2022-23, and expanded the export basket to over 200 countries.
- In 2021-22, the exported agricultural products were worth USD 24.77 billion.
- As of October 2023, India's agricultural exports have reached $ 43.68 billion, indicating a steady growth trajectory.
- Major agricultural exports include rice, marine products, spices, oil meals, and fresh fruits and vegetables.
- The export basket is diversifying, with greater emphasis on value-added products like processed foods and organic produce.
- **Major commodities in export basket** – rice (both Basmati and non-basmati), marine products, sugar, spices, cotton, wheat and buffalo meat.
- India has emerged as the net exporter of agricultural products, with exports in 2021-22 touching a record USD 50.2 billion **(Economic Survey 2022-23).**
- Keeping in mind Prime Minister Narendra Modi's call for **'vocal for local'** and **'Atmanirbhar Bharat'**, Agricultural and Processed Food Products Export Development Authority (APEDA) has been focusing on the promotion of exports of locally sourced GI (Geographical Indications) tagged as well as indigenous, ethnic agricultural products.
- New products and new export destinations have been identified and accordingly, various trial shipments have been facilitated.

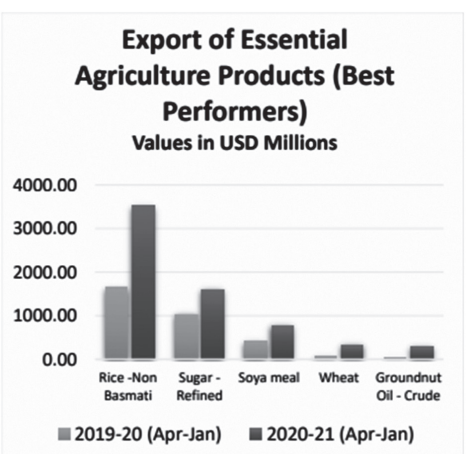


Fig. 14.8

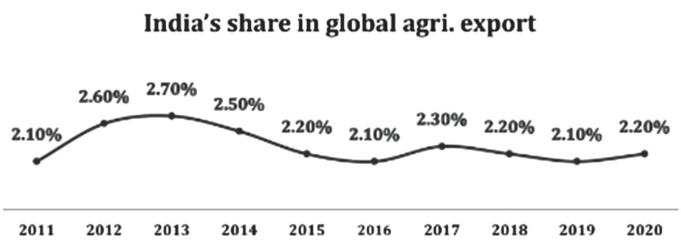


Fig. 14.9

Reports Related to India's Agricultural Exports

- **Doubling Farmers' Income Report (2018):** Emphasises boosting agricultural exports to enhance farmer income and improve productivity.
- **Standing Committee on Commerce Report (2020):** Highlights challenges faced by exporters and recommends policy reforms for market access and competitiveness.
- **Expert Committee on Agricultural Marketing Reforms (2004):** Calls for a dedicated fund for agricultural infrastructure development, paving the way for the AEP 2018.
- The **Economic Survey 2022-23** emphasises the need for prioritising agricultural exports to achieve the $5 trillion economy goal.
  - It highlights the importance of addressing logistical bottlenecks, investing in infrastructure, and promoting value addition.
  - The survey calls for strengthening the institutional framework and fostering collaboration among stakeholders to achieve export targets effectively.

Significance of Agriculture Exports

- High Growth Sector and has been showing sustained positive trends.
- Contribution to India's agricultural GDP and Foreign Exchange.
- Has helped in the development of "Brand India" and the promotion of Organic Farming.

Challenges Faced by Indian Agricultural Exports

Despite being a significant agricultural producer, India's export portfolio exhibits a deficit in high-value and value-added products, accounting for less than 15%. This stands in stark contrast to comparable players like the US (25%) and China (49%), signifying a missed opportunity for increased profitability, farmer income, and global competitiveness.

Several Factors Contribute to This Suboptimal Performance

- **Competitiveness Gap:** Low productivity, inconsistent quality standards, and inadequate post-harvest/transport infrastructure hamper India's export competitiveness.
- **Logistics Burden:** Inefficient supply chains entail elevated logistics costs, diminishing price appeal for international buyers.
- **Market Intelligence Blackout:** Limited access to market information and global linkages restricts Indian producers from capitalizing on export opportunities.
- **Trade Barriers:** Tariff and non-tariff barriers erected by other countries further obstruct market access for Indian produce.
- **Macroeconomic Volatility:** Global economic fluctuations and stringent sanitary & phytosanitary (SPS) standards add another layer of complexity for exporters.
- **Technological Lag:** Reliance on primitive agricultural practices impedes yield optimization and quality improvement, impacting export potential.
- **Stalled Reforms:** Delayed implementation of land and marketing (APMC) reforms creates systemic inefficiencies and discourages farmer participation in high-value agriculture.
- **Financial Constraint:** Limited access to formal credit and insurance dissuades farmers from venturing into export-oriented value-added agricultural production.

Government Initiatives to Boost Agri-Exports

- Safe Food Export Traceability Portal
- "One Lab One Assessment" Portal
- Monitoring Export Alerts Portal
- Agriculture Export Promotion Plan Scheme of APEDA
- National Programme for Organic Production (NPOP)
- National Monetisation Pipeline.
- Agri Udaan Programme for mentoring Agri start-ups
- APEDA has suggested augmenting cargo handling facilities at airports, ports, etc. This will reduce the waiting time.
- **Other Initiatives:** Model Contract Farming act, Model APMC Act, digitization of land records, operation Greens, Market Access Initiative (MAI) Scheme, Market Development Assistance (MDA) Scheme, and Merchandise Exports from India Scheme (MEIS).
- **International Negotiation:** India's proactive role in the WTO negotiations on trade facilitation and public stockholding.
- **Remission of Duties and Taxes on Exported Products (RoDTEP) scheme** has been operationalized for exports with effect from 01.01.2021.

India's Agricultural Export Policy 2018

Key Features

- **Market Development Assistance:** Financial assistance to exporters for participating in trade shows, market research, and brand promotion activities.
- **Special Economic Zones (SEZs):** Incentives and investment benefits for SEZs dedicated to agricultural exports.
- **Cluster Development:** Initiatives to promote clusters for specific agricultural commodities, facilitating resource utilisation and market access.
- **Quality Control and Standards:** Stringent quality control measures to ensure the competitiveness of Indian agricultural products.
- **Institutional Framework:** Coordination and implementation of export promotion initiatives through government agencies, trade bodies, and research institutions.

Elements of Agriculture Export Policy Framework

Strategic Recommendations

- **Policy Measures**
  - Stable Trade Policy Regime
  - Reforms in APMC Act and streamlining of Mandi fee
- **Liberalising Land Leasing norms**
- **Infrastructure and Logistics Boost**
- **Greater involvement of State Governments in Agri Exports**
  - Identification of a nodal State Department/Agency for promotion of agriculture export
  - Inclusion on agricultural exports in the State Export Policy
  - Infrastructure and Logistics to facilitate agricultural exports
  - Institutional Mechanism at State level and cluster level to support exports

Operational Recommendations

- **Promoting Value added exports**
  - Product development for indigenous commodities and value addition
  - Promote Value added Organic exports
  - Promotion of R&D activities for new product Development for the upcoming markets
- **Infrastructure and Logistics to support agricultural exports**
  - Ease of Doing Business & Digitization
  - Developing Sea Protocol
- **Establishment of Strong Quality Regimen**
  - Establish and maintain a single supply chain and standards for domestic and export markets.
  - SPS and TBT Response Mechanism
  - Conformity Assessment
- **Marketing and promotion of "Produce of India"**
- **Self–sufficiency and export oriented production**
- **Research and Development**
- **Creation of Agri-start-up fund**

Foreign Trade Policy 2023 and Its Role in Agriculture Exports

The Indian agricultural sector holds immense potential to not only contribute to domestic food security but also drive economic growth through robust exports. To harness this potential, the government introduces annual Foreign Trade Policies (FTPs) aimed at boosting exports across various sectors, including agriculture.

Key Features of FTP 2023

- **Increased focus on exports:** The policy aims to double India's exports to $2 trillion by 2030, with significant emphasis on agricultural exports.
- **Ease of doing business:** The policy introduces various reforms to streamline export procedures and reduce transaction costs for exporters.
- **Promoting value addition:** The policy incentivizes the processing and value addition of agricultural products to enhance export competitiveness and garner higher returns for farmers.
- **Market access and diversification:** The policy aims to expand market access for Indian agricultural products through trade agreements and diversification of export destinations.
- **Supporting infrastructure development:** The policy promotes the development of infrastructure, especially cold chains and logistics facilities, to facilitate efficient movement and handling of agricultural exports.

Significance

The Foreign Trade Policy 2023 presents a significant opportunity to transform India's agricultural sector and unlock its export potential. By addressing the existing challenges and leveraging the policy's provisions, India can:

- **Increase agricultural exports:** Achieving the ambitious $100 billion target and contributing to economic growth.
- **Enhance farmer income:** Empowering farmers through better market access, higher value realisation, and income diversification.
- **Promote sustainable agriculture:** Encouraging climate-resilient crops, value addition, and responsible resource management.
- **Strengthen the rural economy:** Creating jobs and improving rural livelihoods through increased export activities.

Continued efforts towards enhancing infrastructure, promoting technological advancements, and fostering collaboration among stakeholders are crucial for ensuring the success of the FTP 2023 and achieving its transformative potential for the Indian agricultural sector and the overall economy.

IGNITE YOUR MIND

Do you think the government's emphasis on promoting value-added exports and creating clusters for specific agricultural commodities is sufficient to address the competitiveness gap in India's agricultural exports? How can these initiatives be further strengthened to make Indian agricultural products more attractive in the global market?

FOOD PROCESSING IN INDIA

Introduction

The food processing sector is one of the important segments of the Indian economy in terms of its contribution to GDP, employment, and investment. During the 5 years preceding 2018-19, the Food Processing sector has been growing at an Average Annual Growth Rate (AAGR) of around 10.00%. The sector constituted as much as 8.98% and 11.11% of the GVA (Gross Value Added) in the Manufacturing and Agriculture sector respectively in 2018-19. Food Processing includes the process of value addition to produce products through methods such as preservation, addition of food additives, drying etc. with a view to preserve food substances in an effective manner, enhance their shelf life and quality.

FOOD PROCESSING METHODS

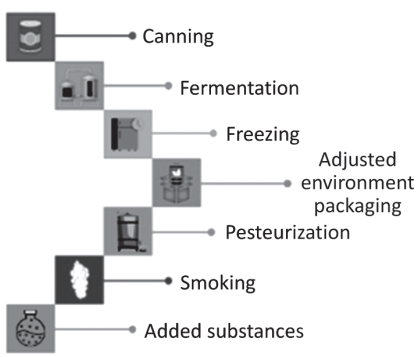


Fig. 14.10

Monitoring of Food Processing

- **Ministry of Food Processing Industries (MOFPI):** It was formed in 1988, the Ministry is the nodal agency for FPI and is concerned with formulation and implementation of the policies & plans for the food processing industries within the overall national priorities and objectives.
- **Department of Animal Husbandry, Dairying & Fisheries:** The Department is responsible for matters relating to livestock production, preservation, and protection from disease and improvement of stocks and dairy development. It also looks after all matters pertaining to fishing and fisheries, inland and marine.

Need For Food Processing Industries

- **Lack of Cold Storages:** Despite India's impressive production capacity, there is a lack of proper storage and infrastructure facilities. India wastes tons of food from farms to processing units, and delivery due to lack of cold storage facilities in India.
- **Harvest and Post-Harvest Losses:** The study has estimated that harvest and post-harvest losses of major agricultural produces at national level was of the order of ₹ 44,143 crore per annum at 2009 wholesale prices, whereas, it was at ₹ 92,651 crore calculated using production data of 2012-13 at 2014 wholesale prices.
- **Food and Nutritional Security:** India has a significant proportion of population which is undernutrition (1/3 of population), stunted and wasted. Horticulture and fruits are much desirable for this problem and wastage reduction will have a decisive impact here.

Types of Processed Food

According to the Food and Agricultural Organization's (FAO) definition, processed foods can be of three types: Primary, Secondary and Tertiary.

Primary Processing	Primary Processing relates to conversion of raw agricultural produce i.e. milk, meat and fish into a commodity that is fit for human consumption. It involves steps such as cleaning, grading, sorting, packing etc.
Secondary Processing	Secondary Processing means modification of the basic product to a stage just before the final preparation at the consumer's kitchen, e.g. tomato puree, ground coffee, etc.
Tertiary Processing	It is related to high value-added ready-to-eat products like dairy products, ice cream, instant noodles, sauces, jams etc.

According to the nature, extent and purposes of the industrial processes the food items undergo, they can be classified as:

Group 1: Unprocessed and Minimally Processed Foods	Unprocessed (or natural) foods are the edible parts of plants (such as fruit, leaves, stems, seeds, roots) or from animals (such as muscle, offal, eggs, milk), and also fungi, algae and water, after separation from nature. Minimally processed foods are natural foods modified through removal of unwanted parts and various methods such as drying, grinding, pasteurisation, and packaging.

Group 2: Processed Culinary Ingredients	Processed culinary ingredients include oils, butter, lard, sugar and salt. These are substances derived from group 1 foods or else from nature by processes such as pressing, refining, grinding, milling, and drying.
Group 3: Processed Foods	They are made by adding salt, oil, sugar or other substances. These include canned or bottled vegetables or legumes (pulses) preserved in brine; whole fruit preserved in syrup; tinned fish preserved in oil.
Group 4: Ultra Processed Foods	Ultra-processed foods are industrial formulations made through a series of techniques and processes. They include carbonated drinks, packaged snacks, confectionery, pre-packaged meals, and more. These foods often contain additives, undergo assembly using industrial methods, and come in synthetic packaging.

Facts and Figures Status of Food Processing in India (FPI)

- India's food production industry worth over $400 billion, but food processing significantly low-as per FICCI Report
- India is the world's second largest producer of fruits & vegetables after China but hardly 2% of the produce is processed.
- In spite of a large production base, the level of processing is low. Approximately 2% of fruits and vegetables, 8% marine, 35% milk, 6% poultry are processed.

Significance of Food Processing Industry (FPI)

- **Sunrise Industry:** Food Processing Industry (FPI) is one of the sun-rise industries in India which is of enormous significance. It provides vital linkages between the two pillars of the economy, i.e. agriculture and industry.
- **Employment Generation:** The development of food processing industries would generate employment opportunities, especially in rural areas where agriculture is a primary occupation. It can provide income diversification, improve livelihoods, and contribute to poverty alleviation. Though 70% of the food processing industry is in the unorganised sector, it contributes only 15% in terms of value.
- **Curbing Migration:** Provides employment in rural areas, hence reduces migration from rural to urban areas.
- **Increasing Farmers Income:** Food processing increases agricultural income by adding value to raw agricultural products, extending their shelf life, creating new market opportunities, and generating higher profits for farmers.
- **Reduces Food Wastage:** In India, around 25-35% food is wasted due to inadequate handling, storage and logistical issues. Only 6% of perishable food is processed at the moment.
- **Curbing Food Inflation:** Processing increases the shelf life of the food thus keeping supplies in tune with the demand thereby controlling food-inflation. For e.g. Frozen Safal Peas are available throughout the year.
- **Nutritional Value:** Food processing techniques such as fortification and enrichment can enhance the nutritional content of food products. Essential vitamins, minerals, and other nutrients can be added to processed foods to address specific nutritional deficiencies in populations and improve overall public health.
- **Crop-Diversification:** Food processing will require different types of inputs thus creating an incentive for the farmer to grow and diversify crops. This also helps in enhancing soil fertility hence, improving overall agricultural productivity and sustainability.
- **Forward-Backward Linkages:** Food processing increases both forward and backward linkages in the agricultural value chain. It creates business-farmer linkages by providing a market for farmers' produce and supplies raw materials for processing.
- **Promotes Organic Farming:** Food processing can help in the development of organic food products by incentivizing more farmers to adopt organic farming practices, leading to an expansion of organic agriculture.
- **Boosts Trade and Earns Valuable Foreign Exchange:** It is an important source of foreign exchange. For e.g. Indian Basmati rice is in great demand in Middle Eastern countries

Scope of Food Processing

- **India's Agricultural Prowess Extends Beyond Specific Crops:** As India, ranks second in the production of essential commodities like rice, wheat, potato, sugarcane, cashew nuts, and tea. This highlights the country's capability to contribute significantly to global food supplies.
- **Increasing Opportunities For Allied Sector:** There is great opportunity for fruits and vegetables processing, fisheries, milk and milk products, meat and poultry, packaged/convenience foods, alcoholic beverages and soft drinks.
- **Resource Rich India:** India is the world's second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector.
- **Global Rankings:** India's agricultural sector is competitive on a global scale. The country consistently ranks among the top five nations in the production of coffee, tobacco, spices, and seeds. This diversified production base provides opportunities for India to cater to various international markets.

- **Potential as a Leading Supplier:** Given its significant raw material base and competitive advantage in various food commodities, India has the potential to emerge as a leading supplier of food items worldwide. This can help meet the increasing global demand for quality agricultural products.
- **Growing Urbanisation:** According to the Census 2011, the total urban population constitutes 31.16% of the population – exemplifying increased disposable incomes, changing lifestyles and rising demands for processed food.
- **Growing Market:** India's food market is rated fifth in production, consumption, and export while accounting for 70% of global sales and placing sixth overall.
- **Agro Climatic Zones:** India has about 26 types of different climatic conditions, 46 varieties of soils are there in India out of total 60 types of soils worldwide. 127 'agro climatic zones' have been identified in India. Also, Indian food is known worldwide for its unique taste and aroma.

Food Processing Sector – Challenges

India's food processing industry, despite its vast potential, faces a multitude of challenges that hinder its growth and export prospects. These challenges can be broadly categorised into two main areas: supply-side constraints and demand-side hurdles.

Supply-Side Struggles

- **Fragmented Farming Landscape:** Small landholdings and limited mechanisation result in low farm productivity and a dispersed marketable surplus. This scarcity of raw materials directly impacts the food processing industry's ability to thrive.
- **Perishable Produce, Fragile Supply Chains:** High seasonality and perishable nature of agricultural produce, coupled with inadequate cold chain infrastructure, lead to significant post-harvest losses (over 30%). Lack of proper intermediation and efficient supply chain management further exacerbate the issue.
- **Dominance of the Unorganized:** The industry is heavily reliant on unorganised segments, accounting for almost 75% of all product categories. This leads to inefficiencies and hinders adherence to quality and safety standards.

Demand-Side Dilemmas

- **Regulatory Maze:** A complex web of laws and regulations, governed by different ministries and departments, creates confusion and delays for businesses. This, in turn, discourages investment and innovation in the sector.
- **Food Safety Concerns:** The ever-growing use of fertilisers, pesticides, and other chemicals raises serious concerns about food quality and safety. Consumers, particularly parents concerned about their children's health, may shy away from processed food due to these concerns, impacting the industry's economic potential.
- **Quality Control Conundrum:** The vast number of players, especially in the unorganised segment, makes implementing and ensuring quality and safety standards a significant challenge. Practices like milk adulteration and fruit ripening using harmful chemicals highlight this issue.
- **Low Consumer Awareness:** Lack of awareness among consumers about nutritional value, food safety, and quality issues hinders the sector's growth. Educating consumers about responsible choices is crucial for building trust and boosting demand for processed food products.

Addressing these bottlenecks is essential to unlock the true potential of India's food processing industry. By streamlining regulations, investing in infrastructure, promoting sustainable farming practices, and fostering consumer awareness, we can create a thriving ecosystem that nourishes both the economy and the nation's health.

Measure Needed For The Development of Food Processing Industries

- **Hand-Holding Approach:** Government should adopt a hand-holding approach by establishing risk sharing mechanisms, fiscal incentives and partnership models for creation of infrastructure for logistics, storage and processing.
- **Enhance Farmer's Income:** Enhance farmer's income so that they can produce organic based food products rather than chemical based.
- **Promoting Village-Level Procurement:** The NITI Aayog, in the Strategy for New India @75 document, recommended village-level procurement centres for perishables such as fruits, vegetables and dairy.
- **Public Investment and Connectivity:** Public investment should be increased in infrastructure development and connectivity, such as building modern processing facilities and transportation networks to enhance efficiency and accessibility throughout the supply chain and ensure minimum wastage of the food products.
- **Human Resource Development:** According to the National Skill Development Corporation (NSDC), approximately 17.8 million individuals need to acquire the necessary skills for the food processing industry by 2022.
- **Encouraging Research & Development (R&D):** R&D is essential in the food processing industry as it drives innovation, improves product quality, enhances food safety measures, increases efficiency, and develops new technologies to meet changing consumer demands.
- **Second Green Revolution and Rainbow Revolution:** These have promoted food processing industries by introducing high-yielding crop varieties and improved farming techniques, which increased agricultural productivity and provided a larger raw material base for food processing.
- **Streamlining the Regulatory Structure:** To ensure scale and economic viability, it's important to develop

backward linkages through supportive regulations for contract and corporate farming, commodity clusters, and intensive livestock rearing.

- **Customised Logistics:** The food processing industry requires tailored logistics solutions to meet its specific needs and challenges effectively.
- **Public Private Partnership (PPP):** The PPP in food processing industries encourages collaboration between government and private entities to invest in infrastructure, technology, and resources, leading to growth and development in the sector

Government Initiatives to Promote Food Processing Sector

Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)	The objective of PMKSY is to supplement agriculture, modernise processing and decrease agri-waste.
Matsya Sampada Yojana	It is a flagship scheme for focused and sustainable development of the fisheries sector in the country.
Production Linked Incentive Scheme for Food Processing Industry (PLISFPI)	To support creation of global food manufacturing champions commensurate with India's natural resource endowment and support Indian brands of food products in the international markets with an outlay of ₹ 10900 crore.
Prime Minister-Formalisation of Micro Food Processing Enterprises (PM-FME) Scheme	It is aimed at promoting 'vocal for local' in the sector, under the Atmanirbhar Bharat Abhiyan, launched in June 2020, to support 2 lakh micro food processing units with credit linked subsidy with a total outlay of ₹ 10,000 crores over the period 2020-2025.
Operation Greens:	The Ministry of Food Processing Industries (MoFPI) has been implementing the "Operation Greens" scheme since November 2018 with a budget of ₹ 500 crore. The scheme aims to promote Farmer Producers Organizations (FPOs) and develop infrastructure for Tomato, Onion, and Potato (TOP) products.
Foreign Direct Investment (FDI) policy	FDI up to 100%, under the automatic route is allowed in food processing industries.
Food Processing Fund (by NABARD)	A special fund in the NABARD worth INR 2,000 crore, designated as the Food Processing Fund, was set up in the FY 2014-15 for providing affordable credit to food processing units in Mega & Designated Food Parks.
National Institute of Food Technology Entrepreneurship and Management (NIFTEM)	It is a higher education institute in Haryana deemed-to-be-university operating under the Ministry of Food Processing Industries (MOFPI).
FSSAI	FSSAI under the Ministry of Health and Family Welfare has issued the Food Safety and Standards (Food Product Standards and Food Additives) Regulations, 2011 and the Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011 which prescribe the quality and safety standards respectively for food products.
Infrastructure	The existing infrastructure such as Kisan Rail and Krishi UDAN, as well as the vast networks of SHGs and FPOs under the DAY-NRLM scheme offer opportunities to bolster food processing efforts, while also promoting local foods and traditional products such as pickle, papad etc.
Farm to Factory Gate (Procurement at Village Level)	The upgrading of 22,000 rural haats into Gramin Agriculture Markets (GrAMS), was a step in the right direction.

National Food Processing Policy 2019

Objectives

- To reduce wastages, increase value addition, ensure better prices for farmers while ensuring availability of affordable and quality produce to consumers.
- To address the challenges of malnourishment and malnutrition by ensuring availability of nutritionally balanced foods.
- To make food processing more competitive and future ready through creation of adequate infrastructure facilities along the supply chain, use of modern technology and innovation, promoting traceability, food safety, encouraging optimum capacity utilisation of assets and resources.
- To position India as the most preferred investment destination for agribusiness and food processing.
- To generate more opportunities for the development of the agribusiness and Food Processing Industry.

SAMPADA Scheme

Government of India (GOI) approved a new Central Sector Scheme – Pradhan Mantri Kisan SAMPADA Yojana (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) with an allocation of ₹ 6,000 crore for the period 2016-20 coterminous with the 14th Finance Commission cycle.

Now Government of India (GOI) has approved the continuation of the Central Sector Scheme – Pradhan Mantri Kisan SAMPADA Yojana (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) with an allocation of ₹ 4600 crore till 31.03.2026 coterminous with the 15th Finance Commission cycle. The scheme will be implemented by the Ministry of Food Processing Industries (MoFPI).

The Following Schemes will be Implemented Under PM Kisan Sampada Yojana

- Mega Food Parks
- Integrated Cold Chain and Value Addition Infrastructure
- Creation/Expansion of Food Processing/Preservation Capacities (Unit Scheme)
- Infrastructure for Agro-processing Clusters
- Creation of Backward and Forward Linkages
- Food Safety and Quality Assurance Infrastructure
- Human Resources and Institutions

Objectives of PM Kisan SAMPADA Yojana

- **Boost food processing sector:** The scheme aims to increase the level of food processing in India from 10% to 25% by 2025, leading to enhanced value addition and reduced wastages.
- **Improve farmer income:** By creating efficient supply chains and better market access, the scheme seeks to double farmer income by 2024.
- **Create employment opportunities:** The food processing sector has immense potential for job creation, and PM Kisan SAMPADA aims to generate millions of new jobs, particularly in rural areas.
- **Strengthen infrastructure:** The scheme focuses on developing modern infrastructure, including cold chain facilities, processing units, and storage facilities, across the country.
- **Promote value addition:** Encouraging value addition through processing, branding, and packaging will enhance the competitiveness of Indian food products in the global market.

Key Features

- **Financial assistance:** SAMPADA provides financial assistance to entrepreneurs and farmers in the form of grants and subsidies for setting up new food processing units and upgrading existing ones.
- **Technical support:** The scheme provides technical assistance to entrepreneurs through training programs and consultancy services.
- **Market access:** SAMPADA helps food processing units access new markets through trade fairs, exhibitions, and market intelligence.
- **Focus on specific sectors:** The scheme has a special focus on promoting the processing of fruits and vegetables, milk, meat, and marine products.

Data and Achievements

- **Approved projects:** As of December 2023, total of 1132 projects for food processing have been approved in the 36 states/UTs with total project cost of ₹23071.29 crores.
- **Project types:** The approved projects cover various segments, including cold chain infrastructure (44%), food processing units (32%), and agro-processing clusters (24%).
- **Estimated impact:** Initial estimates suggest that the SAMPADA scheme has the potential to increase milk processing capacity by 10% and reduce post-harvest losses by 5%.
- **Expert Committee on Agricultural Marketing Reforms (2004):** Calls for promoting value addition and reducing post-harvest losses through infrastructure development.

Pradhan Mantri Matsya Sampada Yojana (PMMSY)

The Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India implemented Pradhan Mantri Matsya Sampada Yojana, A scheme to bring about Blue Revolution through sustainable and responsible development of fisheries sector in India at an estimated investment of ₹ 20050 crores for holistic development of fisheries sector including welfare of fishers. PMMSY is being implemented in all the States and Union Territories for a period of 5 years from FY 2020-21 to FY 2024-25.

Objectives

- Harness the potential of the fisheries sector in a sustainable, responsible, inclusive and equitable manner.
- Enhance fish production and productivity through expansion, intensification, diversification and productive utilisation of land and water.
- Modernise and strengthen the value chain including post-harvest management and quality improvement.
- Double fishers and fish farmers' incomes and generate meaningful employment.
- Enhance the contribution of the fisheries sector to Agricultural GVA and exports.
- Ensure social, physical and economic security for fishers and fish farmers.
- Build a robust fisheries management and regulatory framework.

Targets

Fish Production and Productivity	Increasing fish production to 22 million metric tons by 2024-25 from 13.75 million metric tons in 2018-19. Enhancing aquaculture productivity to 5 tons per hectare from the current national average of 3 tons. Augmenting domestic fish consumption from 5 kg to 12 kg per capita.
Economic value addition	Increasing contribution of the fisheries sector to the Agriculture GVA to about 9% by 2024-25 from 7.28% in 2018-19. Doubling export earnings to ₹ 1,00,000 crores by 2024-25 from ₹ 46,589 crores in 2018-19. Facilitating private investment and growth of entrepreneurship in the fisheries sector. Reduction of post-harvest losses from the reported 20-25% to about 10
Enhancing Income and Employment Generation	Generating 55 lakh direct and indirect employment opportunities along the value chain. Doubling the incomes of fishers and fish farmers.

Data and Achievements

- **Increase in fish production:** Since the launch of PMMSY, fish production has witnessed a steady increase, reaching approximately 14.5 million tonnes in 2022-23.
- **Enhanced infrastructure:** Several new fishing harbours, cold storage facilities, and fish landing centres have been constructed or upgraded under the scheme.
- **Technology adoption:** Fishers and fish farmers have increased their adoption of advanced technologies like fish cages, solar-powered boats, and precision aquaculture techniques.

Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) Scheme

Ministry of Food Processing Industry (MoFPI) has launched the Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) scheme under the Aatmanirbhar Bharat Abhiyan with the aim to enhance the competitiveness of existing individual micro-enterprises in the unorganised segment of the food processing industry and promote formalisation of the sector. The scheme to be implemented over a period of five years from 2020-21 to 2024-25 with a total outlay of Rupees 10,000 crore.

Special focus: It supports Groups engaged in Agri-food processing such as Farmer Producer Organizations (FPOs), Self Help Groups (SHGs) and Producers Cooperatives along their entire value chain.

The PMFME Scheme Supports

- Food processing entrepreneurs through credit-linked capital subsidy @35% of the eligible project cost with a maximum ceiling of ₹ 10 lakh per unit.
- Seed capital @ ₹ 40,000/- per SHG member for working capital and purchase of small tools.
- Credit linked grant of 35% for capital investment to FPOs/ SHGs/producer cooperatives.
- Support for marketing & branding to micro-units.
- Support for common infrastructure and handholding support to SHGs, FPOs and Producer Cooperatives.
- Providing Capacity building and training support to increase the capabilities of the enterprises and upgradation of skills of workers.

The main theme of the Scheme is the **One District One Product (ODOP) approach,** a part of a broader strategy of concentrated agro and industrial development focused on each district, offering an array of fiscal incentives, credit, marketing, and policy support.

Key Components of PM FME

- **One-person company registration:** Simplifies business registration for individuals, making it easier for MFPUs to operate formally.
- **Financial assistance and credit support:** Provides access to grants, loans, and credit guarantees to facilitate infrastructure development, equipment upgrades, and working capital needs.
- **Skill development and capacity building:** Offers training programs and workshops on various aspects of food processing, marketing, and financial management to equip MFPUs with the necessary skills.
- **Technological upgradation:** Encourages adoption of clean and energy-efficient technologies through financial incentives and access to technological know-how.
- **Branding and marketing support:** Provides assistance with branding, packaging, and marketing to help MFPUs reach wider markets and improve brand visibility.
- **Cluster development:** Promotes the formation of clusters of MFPUs to facilitate resource sharing, knowledge exchange, and joint marketing efforts.

Achievements of PM FME

- Over 8.5 lakh MFPUs have registered under the scheme since its launch.
- More than 3 lakh loans have been sanctioned to MFPUs, amounting to over INR 14,000 crore.
- Skill development programs have trained over 3 lakh individuals in various aspects of food processing.
- Several food processing clusters have been established across the country to create a favourable ecosystem for MFPUs.

Challenges

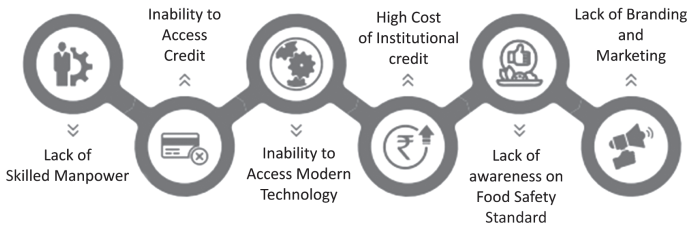

Inability to Access Credit
High Cost of Institutional credit
Lack of Branding and Marketing
Lack of Skilled Manpower
Inability to Access Modern Technology
Lack of awareness on Food Safety Standard

Fig. 14.11: Problems Faced by Micro Food Enterprises

Operation Greens (TOP)

Background

It was launched in 2018 as "Operation Greens" on the line of "Operation Flood", with an outlay of ₹ 500 crore to promote Farmer Producers Organizations (FPOs), agri-logistics, processing facilities and professional management. Accordingly, the Ministry has been implementing the scheme for development of Tomato, Onion and Potato (TOP) value chain since November 2018.

The salient features of the scheme are as below:

- **Objective:** The objective of intervention is to protect the growers of fruits and vegetables from making distress sale due to lockdown and reduce the post-harvest losses.
- **Eligible Crops:** Fruits- Mango, Banana, Guava, Kiwi, Lichi, Papaya, Citrus, Pineapple, Pomegranate, Jackfruit; Vegetables: French beans, Bitter Gourd, Brinjal, Capsicum, Carrot, Cauliflower, Chillies (Green), Okra, Onion, Potato and Tomato. Any other fruit/ vegetable can be added in future on the basis of recommendation by Ministry of Agriculture or State Government (List of eligible crops, selected surplus production clusters and trigger price for intervention under the scheme.
- **Duration of Scheme:** for the period of six months from the date of notification i.e., 11/06/2020.
- **Eligible Entities:** Food Processors, FPO/FPC, Co-operative Societies, Individual farmers, Licensed Commission Agent, Exporters, State Marketing/Co-operative Federation, Retailers etc. engaged in processing/marketing of fruits and vegetables.
- **Pattern of Assistance:** Ministry will provide subsidy @ 50 % of the cost of the following two components, subject to the cost norms:
- **Transportation of eligible crops** from surplus production cluster to consumption centre; and/or
- Hiring of appropriate storage facilities for eligible crops (for maximum period of 3 months);
- **Submission of claim for subsidy** – Eligible entities, who comply with the aforesaid essential criteria may undertake the transportation and/or storage of notified crops from notified surplus production clusters, without any prior approval from MoFPI and thereafter submit their claim on online portal.

Types of Interventions in The Scheme

(I) Long Term Interventions

- Enhancing value realisation of farmers by targeted interventions to strengthen production clusters and FPOs, and linking/connecting the farmers with the market.
- Reduction in post-harvest losses by creation of farm gate infrastructure, development of suitable agri-logistics, creation of appropriate storage capacity linking consumption centres.
- Increase in food processing capacities and value addition in the value chain by creating firm linkages with identified production clusters.

Current Data Achievements

As per the Ministry of Agriculture & Farmers Welfare, Ministry of Food Processing Industries it has been found that:

- **Reduction in post-harvest losses:** Estimated drop in post-harvest losses for TOP crops from 25% to 7% between 2018 and 2023.
- **Increase in F&V production:** Significant rise in production of key fruits and vegetables like tomatoes (20.3 million tonnes in 2022-23 vs. 17.5 million tonnes in 2018-19) and onions (13.2 million tonnes in 2022-23 vs. 10.8 million tonnes in 2018-19).
- **Improved farm gate prices:** Higher prices realised by farmers for TOP crops across various states compared to before OG implementation.
- **Creation of FPOs:** Over 10,000 FPOs formed across the country, empowering farmers and facilitating collective marketing efforts.

Operation Green holds immense potential to revolutionise the TOP value chain in India. By addressing the existing challenges and ensuring wider adoption, the scheme can contribute significantly to improving farmer livelihoods, ensuring price stability, enhancing food security, and boosting overall agricultural growth.

MIEWS Portal

MIEWS Portal is a 'first-of-its-kind' platform for 'real time monitoring' of prices of tomato, onion and potato (TOP) and for simultaneously generating alerts for intervention under the terms of the Operation Greens(OG) scheme. The portal would disseminate all relevant information related to TOP

crops such as Prices and Arrivals, Area, Yield and Production, Imports and Exports, Crop Calendars, Crop Agronomy, etc in an easy to use visual format.

IGNITE YOUR MIND

Do you think the focus on individual micro-enterprises through schemes like the Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) is the most effective strategy for driving growth in the Indian food processing sector? Discuss the potential benefits and limitations of this approach compared to supporting larger processing units and promoting industry consolidation.

SUPPLY CHAIN MANAGEMENT IN THE FOOD PROCESSING INDUSTRY

Supply chain management (SCM) is the management of the flow of goods. It includes the movement and storage of raw materials, inventory and finished goods from point of origin to point of consumption. It entails actively streamlining a company's supply-side activities in order to maximise customer value and gain a competitive advantage in the market.

The food processing industry plays a vital role in transforming raw agricultural produce into consumable food products. An efficient and well-coordinated supply chain is critical to ensuring the smooth flow of goods from farm to fork, minimising losses, and delivering quality food to consumers.

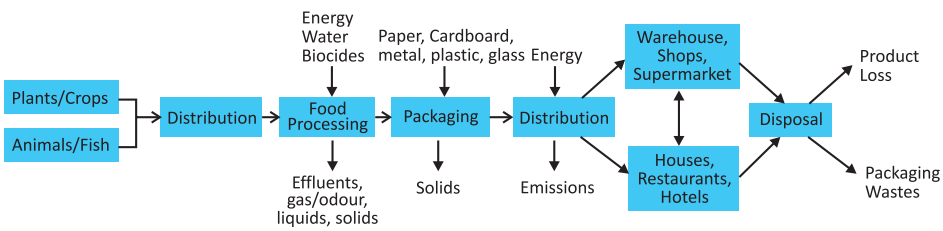


Fig. 14.12

Structure of The Food Processing Supply

The food processing supply chain can be broadly divided into four main stages:

1. Procurement

- Sourcing raw materials from farmers and other suppliers.
- Ensuring the quality and safety of the raw materials.
- Negotiating prices and managing contracts.

2. Processing

- Transformation of raw materials into finished products.
- Various processes like sorting, cleaning, cutting, mixing, cooking, packaging, etc.
- Maintaining hygiene and quality control throughout the process.

3. Distribution

- Transporting finished products to retailers and consumers.
- Utilising various modes of transportation like trucks, trains, ships, etc.
- Maintaining optimal temperature and storage conditions.

4. Retailing

- Displaying and selling finished products to consumers.
- Managing inventory and ensuring product availability.
- Implementing effective marketing and promotional strategies.

Upstream and Downstream Requirements

In the food processing industry, the terms **"upstream"** and **"downstream"** are commonly used to describe different stages of the production and supply chain.

- **Upstream Requirements:** Refer to the activities and processes involved in the early stages of the food processing industry. It includes the sourcing of raw materials, agricultural production, and procurement.
- **Downstream Requirements:** Refers to the activities and processes that occur after the raw materials have been sourced and brought to the food processing facility. It involves the transformation of raw materials into finished food products and their subsequent distribution to consumers.

Upstream	Downstream
Upstream refers to all the activities needed to gather the materials required to create a product. The upstream part of the production process does not do anything with the material itself, such as processing the material. This part of the process simply finds and extracts the raw material. Therefore, any industry that relies on the extraction of raw materials commonly has an upstream stage in its production process.	The downstream stage in the production process involves processing the materials collected during the upstream stage into an end product. The downstream stage further comprises the genuine sale of that product to other businesses, governments or private individuals. Downstream process has direct contact with customers through the finished product. Thus Labour force requirement is more when compared to Upstream.

Upstream	Downstream
Inward movement of the resources towards the processing plant/centre.	Outward movement of the resources away from the processing plant/centre.
Stakeholders: ❑ Raw material supplier ❑ Farmer and other supplier of raw material	Stakeholder: ❑ Distributors ❑ Wholesalers ❑ Retailers ❑ Final customers

Significance of Supply Chain Management (SCM)

- **Cost of Doing Business:** SCM lowers the cost of doing business by reducing purchasing and production expenses. For example, if you own a grocery store and buy tomatoes directly from the farmer, you eliminate the expense of having a third party buy for you.
- **Vital in the Food Industry:** In the food industry, the efficiency of the supply chain is vital to profitability and safety. When one link in the food supply chain, such as a farmer or packaging plant, isn't operating at peak performance, every other link in the chain is negatively affected.
- **Strategic Plan:** Supply chain management supports the strategic plan for the business and helps to build the infrastructure to support future growth, even on a global scale.
- **Improve Quality of Life:** SCM improves the quality of life by Improves Standard of Living, Foundation for Economic Growth, Job Creation, Opportunity to Decrease Pollution, Opportunity to Decrease Energy Use.
- **Brand Development:** Controlling manufacturing processes, for example, can improve product quality while lowering the risk of recalls and lawsuits and assisting in the development of a strong consumer brand.

Challenges to Supply Chain Management

- **Fragmented Supply Chain:** The long and fragmented supply chain results in the wastage and price escalations. This is because of the large share of unorganised players in the supply chain and operating commercial viability challenges.
- **Inadequate Cold Storage and Warehousing Facilities:** Warehousing is a key requirement in the overall supply chain; it is mostly dominated by unorganised players. 20% of warehousing is organised currently with 70% of the organised market controlled by the Government.
- **Logistics Issues:** still face challenges related to quality and connectivity. Indian national highways account for only 2% of the total road network but carry 40% of all cargo. Lack of connectivity to ports leads to cost escalations and delays in the goods transferred. Lack of last-mile connectivity from rail transporters.
- **Slowdown in Production Growth:** With around 67 percent of landholdings being marginal, with an average size of 0.4 hectares, more than half of marginal farmers are likely to not have any excess income to spare beyond subsistence, hindering the improvements in farm-level productivity.
- **Large Informalisation:** More than 50% of the industries in the food processing sector is concentrated in the informal sector and are small scale industries. Therefore they cannot achieve economies of scale and avail the benefits from the formal financial sector.
- **Complex Regulatory Environment:** India has a complex regulatory environment, with multiple layers of bureaucracy and a range of laws and regulations that can vary by state.
- **Lack of System Integration:** The supply chain needs to be designed and built as a whole in an integrated manner. The process of new product development, procurement and order to delivery processes should be well designed and well supported with the help of IT tools and software.

Suggestions/Measures Needs to be Taken

- **Regulate Demand-Supply:** Demand and supply uncertainty requires an efficient supply chain strategy to optimise profitability. The supply chains should adopt a combination of the risk-hedging and responsive supply chain. Supply chains must try to cope with demand and supply chain uncertainty to be responsive to unpredictable demand.
- Public Private Partnership (PPP) is another strategic solution. Supply chains like washing, waxing, grading, sorting, packing, pre-cooling, handling facilities, insurance, finance, transport and processing facilities would add value to supply chain functioning.
- **National Agricultural Market (e-NAM):** It creates a pan India market, facilitates removal of intermediaries, thereby streamlining the entire supply chain.
- **Contract Farming Act:** The new contract farming Act further helps in improving the backward and forward integration of the supply chain.
- **Electronic Negotiable Warehouse Receipt (e-NWR):** To facilitate easy pledge financing by Banks and other financial institutions.
- **Logistic Improvement:** The logistic bottlenecks of the supply chain are being taken care of by leveraging the existing PM-Gram Sadak Yojana, BHARATMALA and SAGARMALA scheme.

Role of Fisheries Industry in Food Processing Industry in India

Fisheries Industry

- India is the third-largest fish and aquaculture-producing country. It accounts for 7.96% of the total global fish production. The industry employs more than 28 million people in India.
- In 2020-21, India's total marine and inland fish production stood at 14.73 million metric tonne (MMT), which includes 11.25 MMT and 3.48 MMT from inland and marine sectors, respectively.
- Fisheries sector plays a crucial role in the national economy and is one of the key contributors to the country's foreign exchange earnings.

ESSENTIAL COMMODITIES ACT, 1955

The Essential Commodities Act, 1955 (ECA 1955) is a crucial piece of legislation enacted by the Indian Parliament to control the production, supply, distribution, and trade of certain essential commodities. This act aims to ensure the availability of these commodities at fair prices to consumers and protect them from exploitation and profiteering.

Key Provisions

- **Definition of Essential Commodities:** The Act empowers the central government to declare any commodity essential by notification in the Official Gazette. The list of essential commodities currently includes food items like rice, wheat, pulses, edible oils, sugar, etc., and other vital products like drugs, petroleum products, and fertilisers.
- **Powers of the Central Government:** The Act grants the central government various powers to regulate the production, supply, distribution, and price of essential commodities. These powers include:
  - **Imposing stock limits:** The government can fix stock limits for traders and dealers to prevent hoarding and speculation.
  - **Regulating prices:** The government can fix maximum retail prices (MRPs) for essential commodities to ensure their affordability for consumers.
  - **Controlling movement:** The government can regulate the movement of essential commodities within and across states to prevent shortages and price fluctuations.
  - **Delegating powers:** The government can delegate its powers to state governments for better implementation of the Act.
- **Prohibition of hoarding and black marketing:** The Act prohibits hoarding and black marketing of essential commodities and prescribes penalties for violators.
- **Establishment of special courts:** The Act provides for the establishment of special courts for speedy trial of offences under the Act.

Recent Amendments and Reforms

The **Essential Commodities (Amendment) Act, 2020:** This amendment removed several commodities from the list of essential commodities, including cereals, pulses, oilseeds, edible oils, onions, and potatoes. This aims to promote private investment and reduce government intervention in the market.

The **Essential Commodities (Amendment) Bill, 2023:** This pending bill proposes further amendments to the Act, including:

Removing more commodities from the list of essential commodities.

Giving states greater power to regulate the production and distribution of essential commodities.

Establishing a price stabilisation fund to manage price fluctuations.

Objectives of The Act

- **Ensuring Food Security:** The Act aims to ensure the availability of essential food items to all citizens at affordable prices, thereby contributing to food security.
- **Preventing Price Fluctuations:** The Act aims to regulate the prices of essential commodities and prevent excessive price fluctuations that could harm consumers.
- **Protecting Consumers from Exploitation:** The Act aims to protect consumers from exploitation by traders and dealers who may engage in hoarding, black marketing, and other unfair practices.
- **Promoting Fair Trade:** The Act aims to promote fair trade practices in the essential commodities market and prevent anti-competitive activities.

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA (FSSAI)

Background

- The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards , 2006 which consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments.
- FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

About FSSAI

- The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command.

- To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi.
- Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

Establishment of The Authority

The Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety and Standards Authority of India (FSSAI) have already been appointed

Functions of FSSAI

FSSAI has been mandated by the FSS Act, 2006 for performing the following functions:

- Framing of Regulations to lay down the Standards and guidelines in relation to articles of food and specifying appropriate systems of enforcing various standards thus notified.
- Laying down mechanisms and guidelines for accreditation of certification bodies engaged in certification of food safety management systems for food businesses.
- Laying down procedure and guidelines for accreditation of laboratories and notification of the accredited laboratories.
- To provide scientific advice and technical support to Central Government and State Governments in the matters of framing the policy and rules in areas which have a direct or indirect bearing of food safety and nutrition.
- Collect and collate data regarding food consumption, incidence and prevalence of biological risk, contaminants in food, residues of various contaminants in foods products, identification of emerging risks and introduction of rapid alert systems.
- Creating an information network across the country so that the public, consumers, Panchayats etc., to receive rapid, reliable and objective information about food safety and issues of concern.
- Provide training programmes for persons who are involved or intend to get involved in food businesses.
- Contribute to the development of international technical standards for food, sanitary and phyto-sanitary standards.
- Promote general awareness about food safety and food standards.

Guidelines and Committees

- **Eat Right India Movement:** Launched in 2018, this national movement aims to create awareness about food safety and healthy eating habits among consumers.
- **Dietary Guidelines for Indians, 2023:** These guidelines provide science-based recommendations for healthy eating, promoting balanced and nutritious diets for Indians.
- **Scientific Panels and Committees:** The FSSAI has constituted various scientific panels and committees to advise on specific food safety issues, such as additives, contaminants, and nutritional standards.

CODEX ALIMENTARIUS

The term "Codex Alimentarius" is Latin and means "food code". Codex standards are international food texts, i.e. standards, codes of practice, codes of hygienic practice, guidelines and other recommendations, established to protect the health of the consumers and to ensure fair practices in the food trade. The collection of food standards and related texts adopted by the Codex Alimentarius Commission is known as the Codex Alimentarius.

Contribution to Standard Development

- Codex standards are adopted in most cases by consensus among Members and are based on the best scientific and technical knowledge.
- International organisations with official Observer Status in Codex may also make interventions, submit written comments, during Codex meetings and on draft standards, but only Members (i.e. Countries) make decisions.

Nature of Codex Standards

- Codex texts are voluntary and do not have binding effects on national food legislation. However, WTO Agreements on Sanitary and Phytosanitary Measures (SPS Agreement) and on Technical Barriers to Trade (TBT Agreement) encouraged WTO members to harmonise national regulations with the international standards.
- Since the SPS Agreement specifically identifies Codex standards, guidelines and recommendations as the international benchmark for food safety, national regulations consistent with Codex standards are deemed to meet the requirements of the SPS Agreement.
  - Under the SPS Agreement, WTO Members are allowed to implement national standards that are more stringent than those of Codex.
    - In doing so, however, WTO Members may be requested to provide scientific justification that such stringent sanitary measures are required to achieve their appropriate level of protection, as well as demonstrate that the measure taken is based on an assessment of risk.
  - Codex standards, guidelines and other recommendations may also be used as a reference in case of a food trade dispute

Uses of Codex Standards

- Codex standards are used by its Members to protect the health of the consumers and to ensure fair practices in the food trade.
- Reference to the Codex Alimentarius occurs in many bilateral and plurilateral trade agreements. Several trade agreements have recently been negotiated or are being negotiated includes
  - Trans-Pacific Partnership (TPP) among twelve Pacific Rim countries;
  - Comprehensive Economic and Trade Agreement (CETA) between Canada and Europe,
  - Transatlantic Trade and Investment Partnership (TTIP) between the European Union and the United States.
    - These agreements typically contain provisions related to SPS measures and invariably reference the standards adopted by the Codex Alimentarius Commission.

Codex Alimentarius Commission (CAC)

The Codex Alimentarius Commission (CAC) is an international food standards body established jointly by the Food and Agriculture organisation (FAO) and the World Health Organization (WHO) in May 1963 with the objective of protecting consumer's health and ensuring fair practices in food trade.

Key Features:

Intergovernmental body: Established jointly by FAO and WHO, open to all member nations.

Collaborative decision-making: Consensus-based approach involving governments, industry, and consumer groups.

Commodities-specific committees: Develop standards for specific food categories (e.g., cereals, fruits & vegetables, fish & seafood).

Range of standards: Covers food hygiene, additives, contaminants, labelling, and methods of analysis.

Data and Achievements

- **Over 200 Codex standards:** Established for various food categories, enhancing food safety and quality globally.
- **Reduced trade barriers:** Harmonisation of standards facilitated international trade, boosting agricultural exports.
- **Improved food safety:** Codex standards contribute to reduced foodborne illnesses and enhanced consumer protection.
- **Capacity building:** Technical assistance and training programs provided to developing countries for implementation.

IGNITE YOUR MIND

Do you think the reference to Codex Alimentarius in bilateral and plurilateral trade agreements is essential for ensuring consistency in food safety regulations globally? How can the incorporation of Codex standards in trade agreements be leveraged to promote a more secure and transparent global food supply chain?

NATIONAL AGRICULTURAL COOPERATIVE MARKETING FEDERATION OF INDIA LTD. (NAFED)

National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) was established on 2nd October 1958. Nafed is registered under the Multi State Co-operative Societies Act.

NAFED was set up with the objective to promote Cooperative marketing of agricultural produce to benefit the farmers. Agricultural farmers are the main members of Nafed, who have the authority to say in the form of members of the General Body in the working of Nafed.

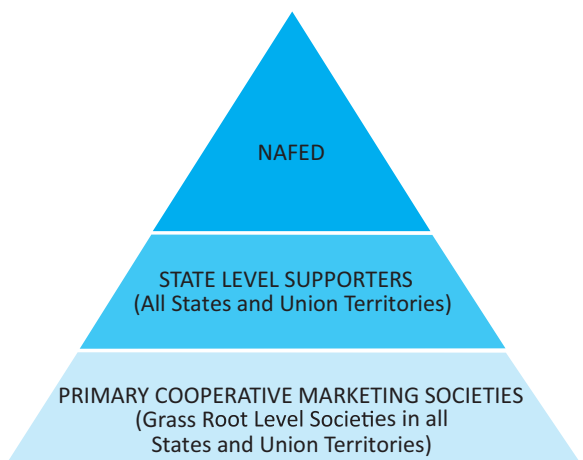


Fig. 14.13: NAFED Working Structure

The Codex Alimentarius Commission plays a critical role in ensuring a safe and sustainable global food supply. Addressing current challenges and implementing recommendations will enable the CAC to continue its vital work in facilitating international trade, promoting food safety, and protecting consumers worldwide.

Key Features

- **Nationwide network:** NAFED has a vast network of state and district level cooperative societies across India, reaching farmers in various regions.
- **Multi-commodity focus:** NAFED deals with a wide range of agricultural commodities, including cereals, pulses, oilseeds, spices, fruits, and vegetables.

- **Market intervention:** NAFED undertakes MSP procurement of various agricultural products to ensure remunerative prices for farmers and stabilise market prices.
- **Value addition:** NAFED promotes value addition in agricultural produce through processing, packaging, and branding activities.
- **Export promotion:** NAFED facilitates the export of Indian agricultural products through direct exports, trade fairs, and market development initiatives.

Significance

- **Empowering farmers:** NAFED aims to improve the economic conditions of farmers by providing them with fair prices for their produce, access to markets, and essential inputs like seeds, fertilisers, and agricultural equipment.
- **Promoting agricultural development:** NAFED works to enhance agricultural production, productivity, and quality standards through various initiatives, including technology dissemination, infrastructure development, and capacity building programs.
- **Strengthening the agricultural marketing system:** NAFED establishes efficient marketing channels for agricultural produce, minimising market risks for farmers and ensuring fair returns.
- **Fostering exports and import substitution:** NAFED promotes the export of Indian agricultural products to international markets and facilitates the import of essential agricultural commodities when necessary.
- **Supporting government policies:** NAFED acts as an instrument of the government in implementing various agricultural policies and schemes like Minimum Support Price (MSP) procurement and price stabilisation measures.

THE TRIBAL COOPERATIVE MARKETING DEVELOPMENT FEDERATION OF INDIA (TRIFED)

Introduction

TRIFED was established in August 1987 under the Multi-State Cooperative Societies Act, 1984 by the Government of India as a National level Cooperative body under the administrative control of the then Ministry of Welfare of India, with the basic mandate of bringing about socio-economic development of tribals of the country by institutionalising the trade of Minor Forest Produce (MFP) & Surplus Agricultural Produce (SAP) collected/ cultivated by them.

Objective

The objective of TRIFED is socio-economic development of tribal people in the country by way of marketing development of the tribal products on which the lives of tribals depend heavily as they spend most of their time and derive a major portion of their income.

Key Features

- **Marketing and promotion of tribal products:** TRIFED provides marketing support and facilitates access to domestic and international markets for tribal products, including handicrafts, handlooms, forest produce, and organic products.
- **Skill development and capacity building:** TRIFED provides training and skill development programs to tribal communities to enhance their production capabilities and entrepreneurial skills.
- **Forest produce development:** TRIFED promotes sustainable harvesting, processing, and marketing of non-timber forest produce (NTFP) to generate income for tribal communities and conserve forest resources.
- **Market infrastructure development:** TRIFED establishes and supports infrastructure projects such as collection centres, warehouses, and retail outlets to improve market access and logistics for tribal communities.

Various Programmes of TRIFED

- **VanDhan Yojana:** This flagship program focuses on empowering tribal communities through value addition and marketing of Minor Forest Produce (MFP).
  - It involves setting up Van Dhan Vikas Kendras (VDVKs) across the country, providing training and equipment for processing MFPs like honey, bamboo, and medicinal plants.
- **TRIFOOD Scheme:** It is a collaborative effort of the Ministry of Food Processing Industries, Ministry of Tribal Affairs, and TRIFEDwhich aims to enhance the value of food products sourced from forest areas by tribal communities through tertiary processing.
  - This initiative is expected to boost the income of tribal populations and contribute to increased revenue for India through the export of these processed items.
- **Subhash Palekar Mission for Natural Farming:** This initiative promotes the adoption of natural farming practices among tribal communities, with an emphasis on preserving soil health, reducing dependence on chemical inputs, and fostering ecological balance.
- **Tribal Haats and Crafts Melas:** TRIFED facilitates the organisation of Haats and Melas across the country, providing a platform for tribal farmers to directly sell their agricultural produce and handicrafts to consumers.

Minor Forest Produce (MFP) Through Minimum Support Price (MSP)

In 2013, the Union Cabinet approved a Centrally Sponsored Scheme focused on the marketing of non-nationalized/ non-monopolized Minor Forest Produce (MFP) and the development of a value chain through Minimum Support Price (MSP). This initiative was targeted at ensuring social safety for MFP gatherers, primarily belonging to Scheduled Tribes (STs), with a significant presence in Left Wing Extremism (LWE) areas.

Financial Allocation:

The scheme had a Central Government share of ₹ 967.28 crore and a State share of ₹ 249.50 crore for the current Plan period.

Key Features:

- Guarantee remunerative prices for tribal populations collecting produce from the forest.
- Provide alternative employment opportunities.
- Establish a fair monetary returns system for various activities related to MFP, ensuring sustainability.
- Ensure forest dwellers receive a share of revenue from sales proceeds after costs are deducted.

Coverage:

Initially limited to Scheduled Areas in eight states with fixed MSPs for 12 MFPs, the scheme was later expanded to cover all states and Union Territories. It encompasses a total of 49 MFPs.

Implementation:

- State-designated agencies are responsible for purchasing MFP at MSP.
- Market correspondents are engaged by designated agencies to ascertain market prices, particularly in major markets trading in MFP.
- The scheme supports primary value addition and provides for supply chain infrastructure such as cold storage and warehouses.
- The Ministry of Tribal Affairs is the nodal Ministry for implementation and monitoring, with the Minimum Support Price determined by the Ministry with technical assistance from TRIFED.

AGRICULTURAL AND PROCESSED FOOD PRODUCTS EXPORT DEVELOPMENT AUTHORITY (APEDA)

It was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by the Parliament in December, 1985. It is a government agency under India's Ministry of Commerce and Industry. It plays a crucial role in promoting the export of agricultural and processed food products from India.

Functions of APEDA

In accordance with the Agricultural and Processed Food Products Export Development Authority Act, 1985, the following functions have been assigned to the Authority.

- Development of industries relating to the scheduled products for export by way of providing financial assistance.
- To undertake surveys and feasibility studies, participation in enquiry capital through joint ventures and other reliefs and subsidy schemes.
- Registration of persons as exporters of the scheduled products on payment of such fees as may be prescribed.
- Fixing of standards and specifications for the scheduled products for the purpose of exports.
- Carrying out inspection of meat and meat products in slaughterhouses, processing plants, storage premises, conveyances or other places where such products are kept or handled for the purpose of ensuring the quality of such products.
- Improving packaging of the Scheduled products.
- Improving marketing of the Scheduled products outside India.
- Promotion of export oriented production and development of the Scheduled products.
- Collection of statistics from the owners of factories or establishments engaged in the production, processing, packaging, marketing or export of the scheduled products.
- Training in various aspects of the industries connected with the scheduled products.

Achievements

- **Export Growth:** India's agricultural and processed food exports have witnessed a remarkable increase under APEDA's guidance. From ₹ 51,293 crore in 2013-14, exports reached a record high of ₹ 1,30,109 crore in 2022-23, signifying a 154% growth within nine years.
- **Product Diversification**: APEDA's efforts have led to the diversification of India's export basket. Basmati rice, buffalo meat, guar gum, groundnuts, and marine products are some of the major contributors to the export boom, signifying a shift beyond traditional exports.
- **Market Development:** APEDA actively participates in international trade fairs and buyer-seller meets, fostering market linkages and brand awareness for Indian agri-products globally. This has expanded India's reach to over 200 countries and territories.
- **Infrastructure Development:** APEDA supports the development of cold chain infrastructure, warehouses, and logistics facilities in key agricultural zones. This reduces post-harvest losses and ensures quality for exports.

MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY (MPEDA)

The Marine Products Export Development Authority (MPEDA) is a Government of India organisation that was established in 1972 to promote the export of marine products from India. The headquarters of MPEDA is located in Kochi, Kerala.

Mission: To "develop and regulate the marine products export industry in India and to make India a leading player in the global marine products market."

Features of The Act

- **Nationalisation of Exclusive Economic Zone (EEZ):** Prohibits foreign fishing vessels from operating within the EEZ, reserving resources for Indian fishers.
- **Licensing and regulation of fishing vessels:** Introduces a permit system for fishing in the EEZ, aiming to improve control and monitor over fishing activities.
- **Sustainable fishing practices:** Promotes responsible fishing practices by regulating mesh sizes, seasons, and catch limits for specific species.
- **Marine conservation:** Establishes Marine Protected Areas and prohibits destructive fishing methods like dynamite fishing.
- **Fishworkers' welfare:** Recognizes the rights and welfare of fishworkers and emphasises their participation in management decisions.

MPEDA has a Wide Range of Functions, Including

- **Promoting exports:** MPEDA provides financial assistance, market research, and export counselling to Indian seafood exporters.
- **Developing infrastructure:** MPEDA has invested in the development of cold storage facilities, processing units, and harbours for the seafood industry.
- **Quality control:** MPEDA implements quality control measures to ensure that Indian seafood meets international standards.
- **Sustainable development:** MPEDA promotes sustainable fishing practices and aquaculture.

COMMODITY BOARDS

There are five statutory Commodity Boards under the Department of Commerce. These Boards are responsible for production, development and export of tea, coffee, rubber, spices and tobacco.

Coffee Board

- Established under the Coffee Act of 1942, the Coffee Board plays a crucial role in nurturing and promoting the Indian coffee industry.
- Led by a chairperson and 32 members, the Board spearheads research activities through its network of research institutes across the country.
- It also provides extension services to coffee growers, implements quality control measures, analyses market trends, and promotes Indian coffee domestically and internationally.
- Additionally, the Board actively works towards improving the lives of coffee workers through its labour welfare programs.

Rubber Board

- Chartered by the Rubber Act of 1947, this statutory body, under the Ministry of Commerce and Industry, spearheads the nation's natural rubber industry development.
- Led by a Chair appointed by the central government, its 27 members represent diverse stakeholder interests. Headquartered in Kottayam, Kerala, the Board fosters growth through research & development (R&D), extension activities, and training initiatives:
  - **R&D & Technology Transfer:** Leads the Central Rubber Research Institute (CRRI) and 10 regional stations to boost yield, disease/pest resistance, and new rubber applications. Empowers farmers and processors by disseminating research findings through extension activities.
  - **Training & Skill Development:** Equips individuals with technical skills across the entire rubber value chain, from cultivation to product development, through the Rubber Training Institute.
  - **Market Promotion & Regulation:** Maintains comprehensive rubber statistics and conducts market research.Implements marketing initiatives to promote Indian rubber domestically and internationally. Manages rubber-related licensing and excise duties.
  - **Socioeconomic & Environmental Impact:** Prioritises labour welfare initiatives for rubber industry workers. Promotes sustainable practices for responsible rubber production.

Tea Board

- Founded in 1954 under the Tea Act, the Tea Board acts as the apex body for the Indian tea industry's development.
- Led by a Chair and 30 government-appointed members representing diverse industry interests, the Board operates from Kolkata with two zonal offices (Jorhat, Assam; Coonoor, Tamil Nadu) and 15 regional offices across major tea-growing states and major cities.
- Three overseas offices (London, Moscow, Dubai) handle tea promotion. Recognizing the small tea sector's importance, a dedicated directorate and sub-regional offices have been established for closer grower engagement.
- **The Board's core functions:**
  - **Production & Productivity:** Increased yield and efficiency through various initiatives.

- **Quality Improvement:** Implementing stringent quality control measures.
- **Market Promotion:** Domestic and international marketing campaigns to build brand India.
- **Worker Welfare:** Implementing social and economic programs for plantation workers.
- **R&D Support:** Funding research efforts for improved cultivation and processing techniques.
- **Data & Information:** Collecting, analysing, and disseminating data to stakeholders.
- **Regulation:** Enforcing control orders across the tea value chain through the Tea Act.

Tobacco Board

- The Tobacco Board was constituted as a statutory body on 1st January, 1976 under Section (4) of the Tobacco Board Act, 1975.
- The Board is headed by a Chairman with its headquarters at Guntur, Andhra Pradesh and is responsible for the development of the tobacco industry.
- While the primary function of the Board is export promotion of all varieties of tobacco and its allied products, its functions extend to production, distribution (for domestic consumption and exports) and export promotion of Flue Cured Virginia (FCV) tobacco.

Spices Board

- Established in 1987, the Spices Board fosters India's cardamom industry and export of 52 scheduled spices. Led by a Chair and 32 members, the Board operates from Kochi with regional offices nationwide.
- **Key functions:**
  - **Cardamom Development:** Supports both small and large cardamom producers.
  - **Export Promotion:** Implements programs and initiatives like spice parks and infrastructure upgrades to boost spice exports.
  - **Northeastern Development:** Runs dedicated programs for spice development in the Northeast region.
  - **Post-Harvest Improvement:** Focuses on enhancing spice quality through initiatives like organic farming and improved processing.
  - **Export Regulation & Quality Control:** Issues export licenses, regulates regional quality labs, and trains personnel for superior spice processing, grading, and packaging.

WOMEN IN AGRICULTURE

Agriculture has the highest percentage distribution of female workers at around 63% (PLFS 2021-22). The **Food and Agriculture Organization** has estimated that if women farmers have the same access to productive resources as men, they would increase the yields on their farms by 20-30%, which would increase at least 2.5-4% to the total agricultural output in developing countries.

Significance of Women in Agriculture

Empowering women in agriculture is not just about equality; it's about unlocking the sector's full potential.

Various Studies Show That

- Investing in women farmers can increase agricultural yields by 20-30%.
- Empowering women can lead to improved nutrition and health outcomes for their families and communities.
- It can also contribute to rural development, poverty reduction, and economic growth.

Women's Widespread Presence

- 80% of rural women depend on agriculture for their livelihood.
- They comprise 33% of cultivators and 48% of agricultural labourers.
- Their contributions extend beyond field work, encompassing animal husbandry, food processing, and marketing.

Diverse Roles, Vital Contributions

- **Planting and harvesting crops:** Women play a crucial role in every stage of crop production, from sowing seeds to reaping the harvest.
- **Managing livestock:** They care for poultry, cattle, and other animals, providing milk, meat, and manure for agricultural activities.
- **Food processing and preservation:** Women are skilled in traditional methods of food processing, like drying, pickling, and fermenting, which extend the shelf life of produce and add nutritional value.
- **Marketing and selling produce:** They actively participate in selling agricultural products at local markets, contributing to household income and economic empowerment.

Problems Associated with Women Farmers

- Land-ownership issues
- Difficulties in access to credit due to male dominance
- Less support from family and society
- Lack of equipment
- Lack of political participation

Government Initiatives For Women Farmers

- **National Mission on Agricultural Extension & Technology (NMAET)** – Sub-Mission on Agricultural Extension (SMAE):
  - **Agriculture Technology Management Agency (ATMA):** It provides for one 'Gender Coordinator' per State to ensure that funds and benefits are provided to them in proportion to their numbers, with minimum 30% of allocation for women farmers.

- **Mass Media Support to Agricultural Extension:** One day specially allocated to cover areas of core competence of women farmers in programs of All India Radio & Doordarshan.

- **Mission for Integrated Development of Horticulture:** Specific coverage of women beneficiaries for programmatic interventions with higher subsidy on tractor, power tiller etc. as compared to men.
- **National Mission on Oilseeds & Oil Palm:** Promotion of women groups with involvement by states in distribution of certified seeds etc.
- **Integrated Scheme for Agricultural Marketing:** Provides financial assistance in Storage Infrastructure Projects under Agriculture Marketing infrastructure (AMI) for Registered FPOs, Panchayats, Women, SC/ST beneficiaries or their cooperatives/Self-help groups.
- **National Food Security Mission:** At least 30% allocation of the funds is for women farmers.
- **National Mission for Sustainable Agriculture:** At least 50% of the allocation is to be utilised for small, marginal farmers of which at least 30% are women beneficiaries/ farmers.

By recognizing and supporting the invaluable contributions of women in Indian agriculture, we can unlock the sector's full potential and build a more equitable and sustainable food system. Their hard work, knowledge, and resilience deserve to be celebrated and nurtured. By investing in their empowerment, we invest in the future of Indian agriculture and the well-being of millions.

IGNITE YOUR MIND

Do you think increasing the representation of women in decision-making processes related to agriculture, such as in agricultural cooperatives and local governance bodies, is essential for fostering gender equality and empowering women farmers? How can such initiatives contribute to overcoming the challenges faced by women in agriculture?

AGROECOLOGY

Agroecology is a holistic approach that integrates ecological and social concepts and principles into the design and management of food and agricultural systems. It aims to optimise interactions between plants, animals, humans, and the environment, while considering the social dimensions necessary for a sustainable and equitable food system.

Advantages of Agroecology

- **Contextualized Solutions:** Agroecology adopts a bottom-up and territorial approach, providing customised solutions to local challenges.
- **Co-Creation of Knowledge:** Innovations in agroecology involve the collaborative generation of knowledge, blending scientific expertise with traditional, practical, and local insights.
- **Empowerment and Adaptability:** Agroecology enhances autonomy and adaptive capacity, empowering producers and communities as key agents of positive change.
- **Transformational Approach:** Unlike incremental adjustments to unsustainable agricultural practices, agroecology seeks to transform food and agricultural systems by addressing root causes and offering holistic, long-term solutions, including a focus on social and economic dimensions.
- **Inclusivity:** Agroecology prioritises the rights of women, youth, and indigenous peoples within the framework of sustainable agriculture.

Why Agroecology is a Better Alternative to Climate-Smart Agriculture (CSA)

- **Fundamental Differences:** Agroecology and CSA differ significantly. CSA may include practices incompatible with agroecological approaches and often perpetuates conventional and industrial agricultural methods.
- **Focus on Food Sovereignty:** Agroecology, particularly in the context of food sovereignty, extends beyond CSA's emphasis on agricultural production. It embraces a transformative vision that challenges business-as-usual and dependency on external inputs.
- **Independence from Agrochemical Corporations:** CSA can perpetuate farmers' reliance on agrochemical corporations and global commodity markets, whereas agroecology promotes local control over natural resources and supports self-sufficiency.
- **Transformative Vision:** Agroecology aligns with transformative visions by incorporating the rights of people to access natural resources, promoting local food production decisions, and reducing reliance on fossil fuels.
- **Preservation of Traditional Knowledge:** Agroecology values traditional knowledge, reducing dependence on external inputs, preserving traditional seeds, and empowering local communities.
- **Social Values:** Agroecology fosters social values like community solidarity, environmental preservation, and cultural dimensions of food, contributing to the development of stable and healthy societies.

The essence of agroecology lies not in laboratories but in the hands of millions of local farmers who, for centuries, have managed their soils, saved seeds, and adapted to changing environments. It is considered the most viable solution for ensuring farmers' food security and resilience to climate change. Supporting the transition to agroecology requires training farmers and influencing policies at national and global levels.

Major Reforms Needed Under a Second Green Revolution in India

India's agricultural sector, despite significant achievements in the first Green Revolution, faces immense challenges. A Second Green Revolution is crucial to ensure food security, farmer income, and sustainable growth. This revolution should focus on several key reforms:

1. **Technological Innovation:**
   - **Adoption of precision agriculture:** Utilising sensors, drones, and AI to optimise water and fertiliser use, reducing waste and environmental impact.
   - **Climate-smart technologies:** Development and adoption of drought-resistant crop varieties, heat-tolerant breeds, and sustainable farming practices.
   - **Digitalization and precision marketing:** Implementing e-commerce platforms and blockchain technology for transparent pricing and market access.
2. **Diversification and Value Addition:**
   - **Promotion of high-value crops:** Encouraging production of fruits, vegetables, spices, and organic products with higher profit margins.
   - **Investment in processing and cold chain infrastructure:** Minimising post-harvest losses, adding value to produce, and creating new jobs.
   - **Focus on agripreneurship:** Fostering young entrepreneurs in food processing, farm machinery, and value chain development.
3. **Institutional Reforms and Market Access:**
   - **Strengthening Farmer Producer Organizations (FPOs):** Empowering farmers through collective bargaining, bulk purchasing, and market linkages.
   - **Revamping Agricultural Produce Marketing Committees (APMCs):** Eliminating unnecessary regulations and promoting efficient market access.
   - **Investing in rural infrastructure:** Improving roads, storage facilities, and irrigation systems to reduce transportation costs and enhance marketability.
4. **Sustainable Practices and Resource Conservation:**
   - **Promoting organic farming and soil health management:** Reducing dependence on chemical fertilisers and pesticides, increasing soil fertility, and mitigating climate change.
   - **Water conservation initiatives:** Implementing drip irrigation, rainwater harvesting, and water-efficient crop varieties to combat water scarcity.
   - **Renewable energy adoption:** Encouraging use of solar and biogas for farm operations, reducing dependence on fossil fuels and promoting sustainability.
5. **Education and Knowledge Dissemination:**
   - **Strengthening agricultural extension services:** Providing farmers with access to training, best practices, and scientific knowledge.
   - **Promoting vocational education in agriculture:** Developing skilled agricultural workforce for processing, marketing, and technology adoption.
   - **Digital outreach and knowledge sharing platforms:** Utilising mobile technology and online resources to disseminate information and connect farmers with experts.

By implementing these major reforms, India can usher in a Second Green Revolution that emphasises not just productivity, but also sustainability, equity, and resilience. This will empower farmers, boost rural economies, and ensure a thriving agricultural sector for generations to come.

FARM WASTE

Farm waste, encompassing a range of materials generated throughout the agricultural production cycle, presents a significant global challenge. Improper management of this waste can harm the environment, human health, and the very foundation of agriculture – healthy soil. However, amidst these concerns, a multitude of solutions are emerging, offering the hope of a more sustainable future for agriculture.

Understanding Farm Waste

- **Types:**
  - **Crop residues:** Stubble, stems, leaves, etc., often burned after harvest, leading to air pollution and soil erosion.
  - **Animal manure:** Can pollute water sources and release greenhouse gases if not properly managed.
  - **Processing waste:** Packaging materials, fertilisers, pesticides, and other byproducts of agricultural processes, contributing to plastic pollution and soil contamination.
  - **Food waste:** Spoiled crops, unsold produce, and food loss throughout the supply chain create economic and environmental burdens.
- **Impacts:**
  - **Environmental:** Air and water pollution, greenhouse gas emissions, soil degradation, and loss of biodiversity.

- **Health:** Respiratory illnesses from air pollution, waterborne diseases, and exposure to harmful chemicals.
- **Economic:** Lost productivity, infrastructure damage from flooding, and reduced land-use potential.

Understanding The Scale of The Issue

- **Global agricultural waste generation:** An estimated 1.3 billion tonnes of agricultural waste are generated annually, with significant variations across regions and crops.
- **Food waste:** Approximately 1/3 of all food produced globally is lost or wasted, amounting to 1.3 billion tonnes per year.
- **Livestock manure:** Global livestock produce around 14 billion tonnes of manure annually, with improper management contributing to environmental pollution.

Sustainable Solutions

- **Composting:**
  - Can reduce greenhouse gas emissions from agricultural waste by up to 50%.
  - Improves soil health and fertility, reducing the need for chemical fertilisers.
- **Biogas production:**
  - Can generate renewable energy from organic waste, offsetting fossil fuel use.
  - One cow can produce enough manure to generate around 2.5 kilowatt-hours of electricity per day.
- **Happy Seeders:**
  - Adoption in India has reduced stubble burning by 15-20% in some regions.
  - Increased wheat yields by 5-10% due to improved soil health.
- **Fungal biocontrol agents:**
  - Reduced disease incidence in crops like wheat and soybeans by up to 70%.
  - Reduced reliance on chemical fungicides, promoting environmental and human health.

Government Initiatives Taking the Lead

- **National Mission on Sustainable Agriculture (NMSA):** Promotes crop diversification, organic farming, and efficient waste management practices, empowering farmers with knowledge and resources.
- **Paramparagat Krishi Bhagya Scheme (PKBY):** Encourages organic farming through financial assistance, reducing reliance on chemical fertilisers and promoting composting.
- **Swachh Bharat Mission (SBM):** Focuses on waste management across rural and urban areas, including the promotion of biogas plants and composting initiatives.
- **Subsidies and incentives:** The government provides support for happy seeders and other farm machinery encouraging sustainable waste management practices.

Way Forward

Combating farm waste requires a collaborative effort. Continued government support, coupled with farmer education, research development, and private sector partnerships, can unlock the full potential of these solutions. Imagine a future where fertile fields flourish alongside renewable energy generation, thanks to the intelligent management of agricultural waste.

AGRICULTURE EXTENSION SERVICES IN INDIA

India has a long and complex history of agricultural extension services, dating back to the early 20th century. These services play a vital role in bridging the gap between research and on-farm application, aiming to:

- **Disseminate:** Knowledge on improved farming practices, new technologies, sustainable resource management, and market trends to farmers.
- **Train and Build Skills:** Equip farmers with the skills and techniques to adopt new practices and technologies.
- **Facilitate Access:** Connect farmers to necessary resources like seeds, fertilisers, credit, and market linkages.
- **Empower Farmers:** Encourage participation in decision-making and collective action through farmer groups and cooperatives.

Key Features of Indian Agricultural Extension System

- **Multi-tiered System:** Comprising Central, State, and District levels, with the responsibility cascading down to village-level extension workers.
- **Public Sector Dominated:** Traditionally dominated by government agencies like Krishi Vigyan Kendras (KVKs) and Agricultural Technology Management Agency (ATMA).
- **Recent Shifts:** Increased focus on private sector participation, farmer-centred approaches, and digital technologies.

Challenges Faced

- **Limited Resources:** Inadequate funding and manpower hinder widespread and effective outreach, particularly in remote areas.
- **Skill Gap:** Shortage of trained extension personnel with expertise in diverse agro-ecological zones and farmer needs.
- **Top-down Approach:** Traditional methods often lack participation and responsiveness to individual farmer needs and priorities.
- **Language and Communication Barriers:** Reaching diverse populations with varying literacy levels requires targeted communication strategies.

- **Limited Technology Adoption:** Factors like risk aversion, lack of awareness, and resource limitations among farmers impede technology adoption.
- **Gender Inequality:** Women farmers often face difficulties accessing extension services and resources due to cultural norms and discrimination.

Government Initiatives

- **Krishi Vigyan Kendras (KVKs):** Established across the country, these centres provide on-farm research, demonstrations, and training to farmers on improved practices, technologies, and sustainable resource management.
- **Agricultural Technology Management Agency (ATMA):** Supports State governments in implementing extension reforms, focusing on farmer empowerment, participatory planning, and resource mobilisation.
- **Minimum Support Price (MSP):** Guarantees minimum prices for certain crops, providing income security and incentivizing production.
- **Soil Health Card Scheme:** Provides farmers with detailed reports on their soil nutrients, enabling them to adopt customised fertilisation practices.
- **Kisan Call Centre:** Offers toll-free access to expert advice and information on various agricultural issues.
- **Scheme for Strengthening Infrastructure for Marketing of Agricultural Produce (SIMAP):** Provides financial assistance for development of market infrastructure and improved market access for farmers.
- **Digital Kisan Platform:** Provides online access to information on markets, weather, prices, and other agricultural resources.

Way Forward

- **Focus on Farmer-centred Approaches:** Tailoring services to specific needs and priorities through participatory methods.
- **Leveraging Technology:** Using mobile apps, digital platforms, and remote sensing to deliver information and facilitate access to resources.
- **Strengthening Public-private Partnerships:** Collaborating with NGOs, private companies, and farmer organisations for wider reach and innovation.
- **Promoting Sustainable Practices:** Integrating climate-resilient agriculture and environmental consciousness into extension programs.
- **Addressing Gender Inequality:** Ensuring equitable access to services and resources for women farmers.

By improving and continuously adapting its agricultural extension services, India can unlock the full potential of its agricultural sector, boost farmer incomes, and enhance food security for its growing population.

E-TECHNOLOGY IN THE AID OF FARMERS

The aim of e-Technology is to promote the adoption and use of ICTs and digital innovations in agriculture, forestry, fisheries, natural resource management, and rural developments.

The e-Technology can be utilised through three basic pillars,which results in digitally empowered farmers:

- Agri-extension & Information
- Services
- Research

Scope and Significance of Adopting E-Technology in Agriculture

- Remedial Measures for water crisis, desertification, crop pests, diseases and a persistent lack of infrastructure can be taken with the use of Information Technology.
- Development of Efficient Methods with use of Survey Drones, Fleet of Agribots, Sensor with animals, Smart tractor etc.
- Effective planning and execution such as keeping track of crops, predicting yields, sowing season, need of the crop and others.
  - **For Example** - Water use efficiency of Israel for drip irrigation.
- Adopting innovative technology to gain control of the changing dynamics and leverage market insight without relying on traders.
- IoT smart farming solutions
- **Providing Logistic support: Kisan Sabha App** intends to implement the most efficient and convenient logistics assistance to the farmers.
- Preventing crop failure and providing insurance (e.g. **Crop Insurance Mobile App**)
- Providing quality seed Information (e.g **Seednet Portal**)
- **Kisan Suvidha** and **Pusa Krishi Mobile App** and **Kisan SMS Portal** for information related to market prices, seeds, pesticides, fertilisers, weather and agricultural machinery, etc.
- **E-procurement of Crops:** The Haryana government has launched the **Meri Fasal-Mera Byora** e-procurement portal. Due to this portal. Reduce Farmer Effort and improve decision-making by collecting and analysing granular data and Weather prediction.

Nanotechnology In Agriculture

- The centre has published **'Guidelines for Evaluation of Nano-based Agri-input and Food Products.**
- 'Nano-biotechnology has long been a priority for the Indian government', which established a **National Nano Mission in 2007.**

- The project looks into how nanotechnology may be used to provide clean drinking water, materials, sensors, and drug delivery, among other things.
- The Department of Science and Technology (DST) is in charge of carrying out the Nano Mission.

Scope and Significance of Nanotechnology in Agriculture

- Nanotechnology can take an important part in the productivity through control of nutrients as well as it can also participate in the monitoring of water quality and pesticides for sustainable development of agriculture.
- Increased productivity with Nanofertilizers
- Nanoparticles act as fungicide carriers and are used to improve low water solubility, decrease volatilization, and improve stability.
- Nanobiosensor for pathogen detection and diagnosis.
- Soil and Water Remediation.
- Increased Product Shelf-life.

Artificial Intelligence (AI) In Agriculture

In 2018, the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) received a Microsoft Artificial Intelligence (AI) for Earth grant to support the continued development of Artificial Intelligence solutions, focusing on sustainable agriculture in developing parts across the globe. In India, this pilot project is implemented in the state of Andhra Pradesh where farmers have always relied on their guesswork to decide when to plant and a combination of ancient traditions.

- **AI in farming can help in increasing crop yield by providing:**
  - Real-time advisory,
  - Prediction of crop prices, and
  - Early detection of pest attacks, precision farming, and others.
    - For example-**CROPTIX** to diagnose crop diseases in the field and alert rural farmers in Kenya and **PEAT**, a machine vision for diagnosing pests/soil defects.

ICT Initiatives For Agriculture Sector

- **mKisan SMS Portal**
- **Kisan Call Centres (KCC)**
- **eSagu** for personalised expert advice to small and marginal farmers.
- **Earik,** the single window to improve access to agricultural information and technology in north-eastern India.
- **aAQUA** is a multilingual online problem-solving system that helps farmers get expert answers to their questions.
- **Direct benefit transfer (DBT) Central Agri Portal.**
- **Agmarknet** for daily market price and real time information about prices, location of commodities and varieties in local languages.
- **Digital Mandi** is an electronic trading platform for agri-commodities.
- **e-Choupal** is a village kiosk with a computer and internet access that is managed by an expert.
- **Akashganga** for timely milk collection, proper payment, and higher income for dairy farmers. The system includes electronic milk weighing, fat testing, software capture of unique ID, and printing of payslips and payment settlement.
- The **National Agriculture Market (NAM)**
- The **Digital Agriculture Mission (2021-2025)**

Microsoft	Started a pilot project with Hyderabad-based International Crop Research Institute for Semi-Arid Tropics (a UN agency) in 2016 to build a sowing app to conveniently provide sowing information to farmers.
Karnataka	SAMRAKSHANE, an e-governance solution to handle crop insurance under Pradhan Mantri Fasal Bima Yojana (PMFBY) and the Modified Weather Based Crop Insurance Scheme (MWBCIS).
Karnataka Government and NCDEX Spot Exchange	The Karnataka state government and the National Commodity and Derivatives Exchange (NCDEX) started Rashtriya e-Market Services to encourage competition in agricultural markets and help farmers receive better prices for their crops.
Plantix	Karnataka government launched "Plantix", an app to detect pests, plant diseases, and nutrient deficiencies.
Meghdoot	App launched by the Government to help farmers by providing forecasts relating to temperature, humidity, rainfall, wind speed and direction, etc.

Challenges in Adopting E-Technology

- Duplication of efforts and yet lack of proper infrastructure.
- Absence of right inputs and advisory along with adoption inertia due to traditional attitude.
- Financial constraints.
- Lack of awareness and education.
- Electricity, Connectivity and Cellular Bandwidth.
- Cyber Security and Government's map restriction policies.
- Linguistic diversity as a barrier.

Way Forward

- Raising digital literacy and developing more Farmer-centric Mobile Apps and promoting research and innovations in this regard.
- Outreach and awareness activities with informative content and proper monitoring.
- Developing the concept of smart villages with development of intelligence infrastructure, adoption of sustainable practices and linkage of rural communities to institutional mechanisms.
- Technology adoption can help the farm product to reach from "local to global" market efficiently.
- Would help convert the image of the Indian "Peasant farmer" into an "Entrepreneur farmer".

IGNITE YOUR MIND

Do you think the widespread adoption of e-Technology in agriculture can bridge the existing digital divide and empower farmers with real-time information, advisory services, and market access? How can government and private sector collaborations contribute to overcoming challenges like connectivity and digital literacy in rural areas?

BIOTECHNOLOGY IN THE AID OF AGRICULTURE

- Can improve the productivity of farms of small and marginal farmers.
- Can be utilised to develop heat-tolerant, drought-resistant and early-maturing varieties.
- Increasing water-stress requires water-use efficiency of agriculture.
- Develop less harmful pesticides such as biopesticide or herbicide-tolerant, pest-resistant varieties, e.g., Bt Cotton.
- Can be effectively used to improve the productivity of agriculture. E.g. high-yielding varieties of wheat such as DBW 187, DBW 303 etc.
- Biotechnologies such as artificial insemination, Embryo transfer, in-vitro fertilisation etc. can improve milk production and drought-resistance of the breeds. Biotechnology can protect livestock from diseases.
- **Fertilisers:** Biotechnology can reduce the usage of fertilisers in Indian farms and consequently ill-effect due to eutrophication. E.g. recently developed nano urea has higher uptake.
- **Bioremediation:** Biotechnology can be used to clean up contaminated soils and water bodies
- **Post-Harvest Management:** Biotechnology can be used to develop technologies that can improve the storage and preservation of crops thereby reducing post-harvest losses, especially in horticulture crops.

DIGITAL AGRICULTURE MISSION (2021-2025)

The Digital Agriculture Mission 2021-2025 is a five-year initiative launched by the Indian government in September 2021 to leverage cutting-edge technologies like artificial intelligence (AI), blockchain, remote sensing, drones, and robots to transform the agriculture sector. The mission aims to improve farmer income, enhance farm productivity, and create a more sustainable and resilient agricultural ecosystem.

Mission Components

The Mission has Eight Key Components

- **Farmer Producer Organizations (FPOs):** To promote the formation and growth of FPOs, which can help farmers bargain for better prices for their produce, access better quality inputs and services, and improve their market access.
- **Digital Infrastructure:** To create a robust digital infrastructure that includes soil health cards, weather forecasting systems, and market intelligence platforms.
- **Market Infrastructure:** To develop efficient and transparent market infrastructure, including e-mandis (online trading platforms) and cold chain facilities.
- **Value Chain Development:** To improve the efficiency and transparency of agricultural value chains through investments in logistics, processing, and branding.
- **Cybersecurity:** To create a robust cybersecurity framework to protect the digital infrastructure and data from cyberattacks.
- **Skill Development & Capacity Building:** To train farmers and other stakeholders in using digital technologies in agriculture.
- **e-Governance:** To leverage digital technologies to improve the efficiency and transparency of government services in agriculture.
- **Data-Driven Agriculture:** To collect and analyse agricultural data to make informed decisions about farm management, resource allocation, and policymaking.

Outcomes and Targets

The Mission has Set Ambitious Targets For Each Component, Such as

- Forming 10,000 FPOs by 2025
- Issuing soil health cards to all farmers by 2024
- Developing 5000 rural haats (markets) by 2025
- Setting up 100 cold chain projects
- Training 1 million farmers in digital skills by 2025
- Launching a national e-Mandi platform

Overall, the Digital Agriculture Mission 2021-2025 has the potential to revolutionise Indian agriculture by making it more efficient, productive, and sustainable. The success of the mission will depend on effective implementation, stakeholder participation, and continuous innovation.

VARIOUS COMMITTEE RELATED TO AGRICULTURE

Committee	Objective
Ashok Dalwai Committee	**For doubling Farmers income**
Arvind Subramanian Committee	Tackle pulse shortage review minimum support price and bonus for pulse.
N. Narsimhan Committee	Regional Rural Bank
B Sivaraman Committee	For development of NABARD
Mahesh Kumar Jain Committee	It recommended about Agriculture Credit: The central and state governments need to increase their capital expenditure which will stimulate the demand for investment credit in agriculture. Banks should provide crop loans only through Kisan Credit Cards in order to curb the misuse of interest subsidy. Loan waivers should be avoided.
Vaidyanathan Committee	The norms for fixing water rates, cost escalation on the Operation and Maintenance (O&M) component of economic water rates. Conversion of volumetric supply of water rates from crop-wise and area-wise water rates for different agro-climatic zones.
Shanta Kumar Committee	Hand over Procurement to state: The FCI should hand over procurement operations of wheat, paddy, and rice to states that have gained sufficient experience and infrastructure. Outsourcing: FCI should outsource its stocking operations to various agencies such as Central Warehousing Corporation, State Warehousing Corporation, Private Sector under the Private Entrepreneur Guarantee (PEG) scheme.
Mohan Singh Mehta Committee	For the development of Krishi Vigyan Kendra.
Kelkar Committee	It recommended the rationalisation of subsidy on Fertiliser.
M S Swaminathan Committee	It recommended MSP should be at least 50% more than the weighted average cost of production. Millets and other nutritious cereals should be permanently included in the PDS.
Ramesh Chandra Committee On Food And Agriculture Policy (2013)	It was constituted to examine the methodological issues in fixing MSP,
Meena Kumari Committee	For review of deep-sea fishing policy.

CONCLUSION

Digital technology-driven improvements in agriculture can transform agriculture into a profitable enterprise through higher crop yields, resource-effectiveness, improved marketing and enhanced sustainability. To encourage digital agripreneurship, there is need to create pools of digitally-skilled farmers. Government initiatives like AgriStack can help overcome issues in deployment of ICT based on convergence of various stake holders.

Industries

15

INTRODUCTION

An industry is a sector of the economy that produces goods or services. Industries are categorized into types like manufacturing, technology, agriculture, and services. They are crucial for economic growth, employment, and innovation. Industries vary in scale from small businesses to multinational corporations. They adapt and evolve with technological advancements and market demands.

SECTORS OF INDUSTRY

Primary Sectors

This sector of a nation's economy includes agriculture, forestry, fishing, mining, quarrying, and the extraction of minerals. It may be divided into two categories: genetic industry, including the production of raw materials that may be increased by human intervention in the production process; and extractive industry, including the production of exhaustible raw materials that cannot be augmented through cultivation.

The genetic industries include agriculture, forestry, and livestock management and fishing—all of which are subject to scientific and technological improvement of renewable resources. The extractive industries include the mining of mineral ores, the quarrying of stone, and the extraction of mineral fuels.

Primary industry tends to dominate the economies of undeveloped and developing nations, but as secondary and tertiary industries are developed, its share of the economic output tends to decrease.

Secondary Sector

This sector is also called manufacturing industry,

- It takes the raw materials supplied by primary industries and processes them into consumer goods or
- It further processes goods that other secondary industries have transformed into products, or
- It builds capital goods used to manufacture consumer and nonconsumer goods.

Secondary industry also includes energy-producing industries (e.g. hydroelectric industries) as well as the construction industry.

Secondary industry may be divided into **heavy, or large-scale,** and **light, or small-scale, industry**.

- **Large-scale industry** generally requires heavy capital investment in plants and machinery, serves a large and diverse market including other manufacturing industries, has a complex industrial organization and frequently a skilled specialized labour force, and generates a large volume of output.
  - Examples would include petroleum refining, steel and iron manufacturing (see metalwork), motor vehicle and heavy machinery manufacture, cement production, nonferrous metal refining, meat-packing, and hydroelectric power generation.
  - **Light, or small-scale, industry** may be characterized by the nondurability of manufactured products and a smaller capital investment in plants and equipment, and it may involve nonstandard products, such as customized or craft work. The labour force may be either low skilled, as in textile work and clothing manufacture, food processing, and plastics manufacture, or highly skilled, as in electronics and computer hardware manufacture, precision instrument manufacture, gemstone cutting, and craft work.

Tertiary Sector

This broad sector, also called the service industry, includes industries that, while producing no tangible goods, provide services or intangible gains or generate wealth. This sector generally includes both private and government enterprises.

The industries of this sector include, among others, banking, finance, insurance, investment, and real estate services; wholesale, retail, and resale trade; transportation; professional, consulting, legal, and personal services; tourism, hotels, restaurants, and entertainment; repair and maintenance services; and health, social welfare, administrative, police, security, and defence services.

Quaternary Sector

An extension of tertiary industry that is often recognized as its own sector, quaternary industry, is concerned with information-based or knowledge-oriented products and services. Like the tertiary sector, it comprises a mixture of private and government endeavours.

Industries and activities in this sector include information systems and information technology (IT); research and development, including technological development and scientific research; financial and strategic analysis and consulting; media and communications technologies and services; and education, including teaching and educational technologies and services.

INDUSTRY IN INDIA

Industry holds a prominent position in the Indian economy, accounting for 31% of GDP, on average, during FY12 and FY21 and employing over 12.1 crore people. The sector's relevance can be identified through various direct and indirect linkages with other sectors, contributing to economic growth and employment. First, it ensures that domestic production can accommodate domestic demand and reduces the reliance on imports. Thereby assisting in the improvement of trade and current account balances. Second, industrial growth has multiplier effects, which translates into employment growth. Some industries, such as textiles and construction, have high employment elasticities. Third, industrial growth spurs growth in services sectors such as banking, insurance, logistics, etc.

INDUSTRIAL POLICIES IN INDIA

A country's **industrial policy (IP)** or **industrial strategy** is its official strategic effort to encourage the development and growth of all or part of the economy, often focused on all or part of the manufacturing sector. The government takes measures "aimed at improving the competitiveness and capabilities of domestic firms and promoting structural transformation".

EVOLUTION OF INDUSTRIAL POLICY PRIOR TO 1991

After independence, India opted for a mixed economy, which, in the view of the policymakers, combined the best features of socialism without its drawbacks. Thus India was going to be a socialist society with a strong public sector but also with private property and democracy. Both the government and the market were going to play an important role in shaping the economy. The idea of a mixed economy was not something that was adopted after independence; rather it was the outcome of a gradual process of thinking that was evolving within the Congress party and outside. With this view, India brought out its 'Industrial Policy Resolution' of 1948.

Industrial Policy Resolution of 1948 (IPR-1948)

It envisaged a mixed economy for India in which the coexistence of the public sector and private sector was accepted as the hallmark of policy. The IPR 1948 classified the industries into broadly four categories based on whether the government or private sector would play a major role in the establishment of these industries.

1. **State Owned Monopolies:** The industries in this sector were to be completely monopolised by the State. The monopolised industries included:
   (a) Arms and ammunition
   (b) Production and control of atomic energy,
   (c) Ownership and management of railway transport.
2. **Basic Industries:** These industries were considered basic in nature for the development of the economy and were under the central government. However, the existing private companies operating in these sectors were allowed to continue and it was decided that the government will consider taking over those undertakings after ten years by paying a compensation. The industries included in this category were: **Coal, Iron and Steel, Aircraft manufacture etc.**
3. **Regulated Industries:** Industries of such basic importance that the Central Government would feel it necessary to plan and regulate them. The government of India would regulate pricing, quantity of production etc. for mass consumption. The industries included in this category were:
   (a) Automobiles, tractors, prime movers, electric engineering, heavy machinery, machine tools
   (b) Heavy chemicals, fertilisers, non-ferrous metals,and woollen textiles,
   (c) Cement, Sugar and new spring, Air and sea-transport etc.
4. **Private Sector:** Remainder of industrial field was left open to the private sector – individuals as well as co-operatives.

The basic purpose of the Industrial Policy of 1948 was to bring about economic stability so that a climate favourable to investment is created. The government was successful in providing the mixed economy framework with a place for the public as well as the private sector. The government recognised the need for foreign capital in the process of Industrialisation of the economy, but insisted that while inviting foreign capital it would be ensured that majority interest in ownership and management would remain in Indian hands.

Industrial Policy Resolution of 1956 (IPR-1956)

With the new policy, the scope of the public sector widened. The impact of the 2nd 5-year plan, based on the Mahalanobis model, was clearly visible. The new policy reserved seventeen industries exclusively for the public sector. The reserved industries included iron and steel, mining, machine tool manufacture, and heavy electrical plants.

The logic behind "reservations" were:

- The industries reserved are of basic importance.
- A huge scale of investment was required which only the state could provide.

Under the new policy, industries were classified into three categories:

1. **Schedule A:** Industries which are to be the exclusive monopolies of the State. 17 industries listed in this category were:

(a) Arms and ammunition, atomic energy, iron and steel, heavy castings, heavy machinery, heavy electrical industries.

(b) Coal, mineral oils, iron ore, and other important minerals like copper, lead and zinc;

(c) Aircrafts, air transport, railway transport, shipbuilding, telephone, telegraph and wireless equipment, generation and distribution of electric energy.

2. **Schedule B:** Those which are to be progressively State-owned and in which the State would gradually set up new undertakings. Twelve industries were included in this category:

(a) Other mining industries, aluminium and other non-ferrous metals not included in Schedule

(b) The chemical industry, antibiotics and other essential drugs, fertilisers, synthetic rubber, carbonization of coal, chemical pulp, road transport, and sea transport.

3. **Schedule C:** All other remaining industries and their development were left to the private sector.

How The New Policy was Different From The Old Policy

- The new classification enlarged the areas of industries under state monopoly.
- The classification did not group industries into water-tight compartments and room for exceptions existed.
- The State reserved the right to nationalise an industry in case public interests demanded it.
- The state also provided for the management and rapid growth of village and small industries.

Assessment of The Industrial Policy of 1956

- The Industrial Policy of 1956 has been popularly referred to as the 'Economic Constitution' of the country based on its political counterpart the Constitution of India.
- The basic objective of the Resolution was to develop a socialist democracy within the parameters of the mixed economy framework.
- A leading role was assigned to the public sector to develop heavy and basic industries as well as infrastructure. Private sector was treated as a junior partner and the public sector was considered as a senior partner.

License Raj in India

- The industrial licensing framework was formalised, under the Industries Development and Regulation (IDR) Act of 1951. It became the principal instrument for coordinating and controlling investments in industry.
- It controlled entry, expansion of capacity, technology, output mix, location and import content.
- All Schedule B and many of the Schedule C industries came under the provisions of compulsory licensing and thus the industrial policy established "Licence Raj" in India.
- The system ended in thwarting competition, entrepreneurship, and growth without achieving any of its social objectives.
- The endless delays in clearing applications discouraged the entry of efficient and honest entrants and rewarded wily, inefficient producers who could manipulate the system.
- The basic entrepreneurial decisions, such as the choice of technology and the size and location of plants which impacted costs and prices, were to be taken by the bureaucrats rather than the industrialists. This killed any possible hope of an industrial revolution in India.

Industrial Policy Statement of 1969

The policy statement aimed to solve the shortcomings of the Industrial Policy of 1956. The Industrial Policy of 1969 introduced the **Monopolistic and Restrictive Trade Practices (MRTP) Act 1969**. It intended to regulate the trading and commercial practices of the firms and check monopoly and concentration of economic power.

The act defined Restrictive Trade Practice as "The traders, in order to maximise their profits and to gain power in the market, often indulge in activities that tend to block the flow of capital into production. Such traders also bring in conditions of delivery to affect the flow of supplies leading to unjustified costs."

Under This Act

- Any business with assets of ₹ 20 crore or more were under obligation of taking permission from the govt before expansion, greenfield venture and takeover of other firms.
- For redressal of prohibited and restricted practices of trade, the government set up the **MRTP Commission**. The MRTP Act turned out to be one of the most damaging in modern Indian history. Indian firms lost numerous opportunities to derive economies of scale, and they never had a chance to launch their own industrial revolution.

Industrial Policy Statement of 1973

With a view to prevent excessive concentration of industrial activity in the large industrial houses, the government brought out the Industrial Policy Statement of 1973. It gave preference to small and medium entrepreneurs over large houses and foreign companies in setting up new capacity, particularly in the production of mass consumption goods.

- New undertakings of up to ₹ 10 million by way of fixed assets were exempted from licensing requirements for substantial expansion of assets. This exemption was not allowed to MRTP companies, foreign companies, and existing licensed or registered undertakings having fixed assets of ₹ 50 million and above.

- The policy introduced a new classification of 'Core Industries'. These industries were of fundamental importance for developing other industries. They were: Iron and Steel, Cement, Coal, Crude Oil, Oil Refining, Electricity.
- Private Companies may apply for licences under Core industries if they are not covered under Schedule A. Such companies were supposed to have their total assets at ₹ 20 crore or more.
- Some industries were put under a reserved list in which only MSME could set up industry.
- It allowed partnerships between the Centre, States, and private sector for setting up some industries i.e. the concept of joint sector was introduced. The government could exit such ventures in the future on its discretion. The intention was to promote the private sector with government support.
- To deal with the foreign exchange crunch at that time, the Foreign Exchange Regulation Act (FERA) was passed in 1973. It is believed to hamper the growth and modernisation of Indian industries.
- Permission was given to MNCs to set up subsidiaries with a limit on foreign investment (FI).

Industrial Policy Statement of 1977

The statement highlighted how unemployment has increased, rural-urban disparities have widened and the rate of real investment has stagnated. The policy statement also lamented the stagnated growth rate in India. Since the then elected Janata party was dominated by Gandhians, the Industrial Policy of 1977 the distinctive feature emphasised the growth of the small sector.

The Chief Aspects of The Policy were

- Emphasis was placed on the village industry with a redefinition of the small and cottage industries.
- Decentralised industrialization was given attention to link masses to the process of industrialization.
- Khadi and Village industry was to be reconstructed.
- Serious attention was given to the level of production and prices of essentials for everyday use.
- Foreign investment was restricted and highly regulated. It was completely prohibited in unnecessary areas.
- A list of industries was created where no foreign collaboration of a financial or technical nature was allowed as indigenous technology was already available.
- Fully owned foreign companies were allowed only in highly export-oriented sectors or sophisticated technology areas. Companies like Coca-Cola and IBM exited India during this phase.
- Great deal of attention was given to the level of production and the prices of essential commodities of everyday use.

The industrial policy was not welcomed by big business because it totally denied the use of funds of public financial institutions and banks for the expansion of their business. Such a blanket ban was resented by the business houses. Though the Janata Party intended to shift the balance of the industrial sector in favour of small-scale and cottage industries, it failed to achieve this objective. The list of reserved items also got enlarged from 187 to 807.

Industrial Policy Statement of 1980

The Congress (I) Government led by Mrs. Indira Gandhi, came to power in 1980 and announced its Industrial Policy in July 1980. The statement categorically asserted that it intended basically to follow the Industrial Policy of 1956. It placed focus on the promotion of competition in the domestic market, technological upgradation, and modernization of industries.

The Main Elements of The Policy were:

- Promoting the concept of Economic Federalism by an integrated development of the small and large sectors.
- Setting up of a few nucleus plants in each district, identified as industrially backward, to generate as many ancillaries and small and cottage units as possible.
- Foreign investment via the technology transfer route was allowed.
- MRTP limit was increased to ₹ 50 crores to promote the setting up of bigger industries.
- Policy measures were announced to revive the efficiency of public sector undertakings (PSUs) by developing the management cadres in functional fields viz., operations, finance, marketing, and information systems.

The Industrial Policy of 1980 favoured a more capital-intensive pattern of development and thus it attempted various measures of liberalisation or helping the large sector. It underplayed the employment objective but it was welcomed by big business because liberalisation indicated in the policy was a silent endorsement of capacity increment.

Industrial Policy of 1985 and 1986

Facing the winds of change in the world economy, India's 1985 and 1986 industrial policy resolutions mirrored an ambition to prepare for a new era of globalisation. Building upon the earlier initiative, the 1986 policy aimed to unlock India's industrial potential with several key measures:

- **Foreign Investment Flourishes:** More sectors welcomed foreign investment, now with increased stakes. MNCs could hold up to 49% equity in Indian ventures, fostering technology transfer and collaboration.
- **Bigger is Better:** Recognizing the emerging global market, the MRTP limit rose to 100 crore rupees, paving the way for larger, competitive businesses.
- **Licences Lighten Up:** Industrial licensing was streamlined, freeing 64 industries from the bureaucratic burden, while focusing compulsory licensing on strategic sectors.

- **Sunrise on New Horizons:** High-tech industries like telecommunications, computers, and electronics received special attention, recognizing their future potential.
- **Public Sector Polishing:** Modernization and profitability took centre stage for Public Sector Undertakings (PSUs) to sharpen their competitive edge.
- **Imported Inputs, Exports Takeoff:** Industries relying on imported raw materials gained momentum, boosting export potential and international standards.
- **Foreign Exchange Flow:** Relaxations within the FERA framework facilitated access to foreign exchange, enabling technology absorption and global benchmarking.
- **Agriculture's Scientific Spring:** Technology missions launched by the government ushered in a new era of scientific advancement in agriculture.

These policy resolutions were born amidst the burgeoning World Trade Organization and the impending dawn of a globalised world. Recognizing the shift towards a single, expansive market, India aimed to empower its industries to compete and thrive. The policies addressed historical roadblocks and paved the way for a future where larger, globally-oriented firms could flourish.

While ambitious in their vision, these industrial policy revisions lacked the bold "liberalisation" banner of the later 1991 reforms. Though the government harboured the intent for deep economic transformation, it lacked the necessary political capital to fully pull the trigger.

These policies, coupled with the broader micro-economic strategy, had a fatal flaw: overreliance on foreign capital, much of it at high cost. When industrial performance stumbled, servicing these external debts grew increasingly difficult. External events like the Gulf War further exacerbated the situation.

By the late 1980s, India found itself in the clutches of a severe balance of payments crisis, burdened by high inflation (over 17%) and a ballooning fiscal deficit (over 8%). This profound financial crunch ultimately forced India to seek a new path for economic management in the years to come.

NEW INDUSTRIAL POLICY (NIP), 1991

Background

By June 1991, India was on the brink of a severe Balance of Payments crisis. A perfect storm of interconnected events was battering the economy:

- **Surging oil prices:** The Gulf War (1990-91) sent oil prices skyrocketing, rapidly depleting India's foreign reserves.
- **Remittance drought:** The war also led to a sharp decline in private remittances from overseas Indian workers, particularly in the Gulf region.
- **Inflationary inferno:** Inflation soared to a scorching 17%, further crippling the economy.
- **Fiscal haemorrhage:** The Central Government's gross fiscal deficit ballooned to 8.4% of GDP, draining resources.
- **Foreign exchange famine:** By June, India's foreign exchange reserves barely covered two weeks of imports – a perilous situation.

This near-death experience with a Balance of Payments crisis became the catalyst for India's landmark market liberalisation measures of 1991.

The **initial phase,** driven by the urgency of macroeconomic stabilisation, focused on:

- **Industrial policy overhaul:** Reshaping industrial policies to promote growth and efficiency.
- **Trade and exchange rate liberalisation:** Opening up the economy to trade and investment.
- **Financial and tax reforms:** Streamlining financial markets and the tax system.
- **Public sector reform:** Revamping and restructuring the public sector.

India's bailout from the International Monetary Fund (IMF) came with a hefty price tag – conditions for structural adjustment. As the Indian economy had been heavily shaped by past industrial policies, any desired change required another major policy initiative.

Thus, the New Industrial Policy, announced on July 23, 1991, became the cornerstone of a broader economic reform agenda. Driven by the need for structural adjustment, this policy sparked a transformative journey that continues to shape India's economic landscape to this day.

New Industrial Policy (NIP) marked a **significant departure** from earlier industrial policies in terms of goals and key features. It **highlighted the importance of furthering industrial development** by building on past successes, addressing distortions or weaknesses, and achieving international competitiveness. The liberalised Industrial Policy aimed to propel rapid and substantial economic growth while fostering integration with the global economy in a coordinated manner.

Key Goals of New Industrial Policy (NIP), 1991

The New Industrial Policy (NIP) introduced in 1991 had two main goals that set it apart from previous industrial policies:

1. Redefining Economic Self-Reliance

- Before 1991, India focused on Import Substitution Industrialization (ISI) for economic self-reliance. This meant producing everything domestically to reduce reliance on imports.
- NIP changed the definition of economic self-reliance. Instead of producing everything domestically, it aimed for the ability to pay for imports using foreign exchange earned through exports. This shifted the focus from depending solely on domestic industries.

2. International Competitiveness

- NIP highlighted the importance of developing indigenous capabilities in technology and manufacturing up to global standards.
- Unlike previous policies, NIP explicitly emphasised the need for domestic industries to compete internationally. This marked a significant shift in recognizing the importance of global technology and manufacturing standards for domestic industrial growth.

To achieve these objectives, among others, NIP initiated changes in India's industrial policy environment, which gained momentum gradually over the decade. The **important elements of NIP** can be classified as follows:

Major Changes

1. Industries De-reservation and Private Involvement Through Dis-investment

Since 1991, the government's stance on the public sector **has changed in several ways:**

- **Reduction in Reserved Industries:** Now, only two industries (atomic energy and railway operations) are exclusively reserved for the public sector.
- **Government Equity Reduction:** The government's policy shifted to reduce its role in commercial enterprises, aiming to bring down its ownership in non-strategic Public Sector Undertakings (PSUs) to 26 percent or lower. This includes restructuring or closing down PSUs that cannot be revived.
- **Memorandum of Understanding (MoU):** Public sector units are now brought under performance contracts known as Memorandum of Understanding (MoU), negotiated agreements between the government and specific public enterprises.
- **Board for Industrial and Financial Reconstruction (BIFR):** Struggling public sector units are referred to the Board for Industrial and Financial Reconstruction (BIFR) for rehabilitation or winding up.
- **Manpower Rationalisation:** Voluntary Retirement Schemes (VRS) have been introduced in many PSUs to reduce surplus manpower.
- **Private Equity Participation:** PSUs are allowed to raise equity finance from the capital market, putting pressure on them to enhance their performance.
- **Disinvestment and Privatisation:** To boost corporate efficiency, financial performance, and competition among PSUs, the government adopts disinvestment and privatisation strategies. This involves transferring government ownership in PSUs to private shareholders.

2. Freedom From Industrial Licensing

A significant change known as **"de-licensing of industries"** was introduced in the National Industrial Policy (NIP). Until the 1990s, almost every industry, whether domestic or foreign, needed a licence, unless it fell under the public sector. This licensing requirement applied to industrial businesses with investments in fixed assets (like land, buildings, plant and machinery) above a certain limit.

Now, **except for a few cases**, investors have the freedom to establish new industrial ventures, expand existing ones, change their location, or manufacture new products. The goal of this delicensing is to empower businesses to adapt to rapidly changing external conditions. Entrepreneurs can now make investment decisions based on their commercial judgment. This flexibility encourages technological innovation and boosts international competitiveness. Additionally, industries can leverage the benefits of 'economies of scale' and 'economies of scope' in the current industrial policy environment.

3. Amendments to Monopolies and Restrictive Trade Practices (MRTP) Act in 1969

In 1991, the MRTP Act changed. The rules before starting new businesses or expanding were removed. The size and market share limits for a big company under MRTP were also removed. Now, this law applies to both private and public companies. The focus is now on stopping unfair business practices.

The MRTP Act has been replaced by the **Competition Act in 2002,** which aims to keep competition healthy in the Indian market. The Competition Commission, started in 2003, mainly watches and controls practices that harm fair competition.

4. Liberalised Foreign Investment Policy

Earlier, India's approach to foreign investment was cautious, limiting foreign ownership and control. In the mid-1960s, due to Balance of Payments difficulties, a Foreign Investment Board was established, categorising industries into allowed and restricted for foreign collaboration and investment. Over time, the number of industries open to foreign investment decreased, reaching just 19 by 1973. The enactment of FERA in 1973 marked a restrictive phase.

The New Industrial Policy (NIP) aimed to attract foreign investment and implemented key measures:

- **Repealing FERA, 1973:** Replaced by the Foreign Exchange Management Act (FEMA) in June 2000. This allowed free repatriation of investment and returns, with specific conditions in certain cases.
- **Dilution of FDI Restrictions:** FDI is now permitted in all sectors, barring atomic energy and railway transport. This liberalised approach encourages foreign investors to enter, invest, and operate in Indian industries.

These changes signal a shift towards a more open and welcoming foreign investment environment in India.

5. Agreement For Foreign Technology

Industries are given automatic approvals for technology agreements within certain limits. Indian companies have the

freedom to discuss and decide on the terms of technology transfer with their foreign partners based on their own business judgment.

6. Dilution of Protection to Small Scale Industries (SSI) and Emphasis on Competitiveness

Small Scale Industries (SSIs) held a special position in the Indian economy because they were spread out across the country, utilising resources and skills that might otherwise have gone unused. These industries were safeguarded by various measures due to their ability to create jobs, produce widely consumed goods, and reduce regional disparities. The protective measures included defining SSIs under the IDR Act, 1951, providing concessional credit, fiscal benefits, exemption from certain regulations, and preferential access to raw materials. The government also supported them through market assistance, product reservations, and restrictions on large-scale sector growth in specific areas.

However, since 1991, the protective measures for SSIs have been gradually reduced. In August 1991, a new policy for SSIs signalled the shift from protection to promoting competitiveness. The number of items exclusively reserved for SSIs decreased over time, losing significance as import restrictions were lifted. Concessions on lending rates for small industries were largely withdrawn in the 1990s. The government's exclusive purchase of products from SSIs also reduced. Efforts were made to enhance the technological and export capabilities of SSIs, reflecting a broader shift from protection to fostering competitiveness.

Assessment of The New Industrial Policy (NIP) in India

The central aim of the NIP was to unlock India's economic potential and propel it towards higher growth by:

- **Integrating with the global market:** Reducing trade barriers and opening up the domestic market to foreign competition.
- **Improving the macroeconomic environment:** Stabilising fiscal and monetary policies to curb inflation and attract foreign investment.
- **Shifting away from a state-controlled economy:** Deregulating the industrial sector and encouraging private sector participation.

1. Gradual Approach and Political Influence: The NIP's implementation was marked by a gradual approach, with reforms spread out over several years and often facing setbacks due to changing political landscapes. For instance, the initial momentum of reforms under Prime Minister Rao in the early 1990s slowed down under subsequent governments, highlighting the role of political will in sustaining such large-scale transformations.

2. Industrial Policy Reforms: One of the defining features of the NIP was the significant de-bureaucratization of the industrial sector.

Measures Like

- **Removal of industrial licensing:** Abolished the requirement for prior government approval for setting up most industries, except for strategic sectors like defence and atomic energy.
- **Opening up to private players:** Ended the dominance of public sector enterprises (PSEs) by allowing private companies to enter previously restricted sectors.
- **Competition Law:** Introduced the Competition Act 2002 to replace the Monopolies and Restrictive Trade Practices Act (MRTP Act) and curb anti-competitive practices.

These reforms fostered a more competitive and dynamic industrial environment. For example, consider the de-reservation of the sugar industry. Prior to the NIP, only PSEs could manufacture sugar, but with its opening up to private players, India witnessed a boom in sugar production and a significant reduction in sugar prices benefiting consumers.

3. Trade Policy Reforms: The NIP also ushered in a paradigm shift in trade policy. The focus shifted from import substitution through quantitative restrictions to a more open and market-driven approach characterised by:

- **Gradual reduction of tariffs:** The average import duty dropped from 73% in 1991-92 to around 25% in 1996-97, opening up new opportunities for domestic companies to compete with international rivals.
- **Phasing out of quantitative restrictions:** The system of import quotas for various goods was gradually dismantled, paving the way for greater access to foreign products and raw materials.

This liberalisation, however, wasn't without its challenges. Established domestic industries facing increased foreign competition sometimes lobbied for protectionist measures, resulting in occasional reversals of liberalisation policies. An example is the hike in import duties on certain consumer goods in the late 1990s, which was later reversed following pressure from various stakeholders.

4. Foreign Direct Investment (FDI): Recognizing the importance of foreign capital and technology for boosting industrial growth, the NIP liberalised FDI regulations.

Initiatives Like

- **Automatic approval for investments in most sectors:** Eliminated the need for prior government approval for FDI in many industries, streamlining the process and attracting foreign investors.
- **Establishment of the Foreign Investment Promotion Board (FIPB):** Facilitated FDI applications and provided a single window clearance for foreign investors.

These measures resulted in a dramatic surge in FDI inflows. From almost negligible levels in 1990, FDI flows to India have grown significantly, exceeding $83.57 billion in recent years. The automobile industry stands as a testament to the success of FDI liberalisation. Companies like Suzuki and Hyundai entered the Indian market with substantial investments,

leading to a boom in car production and a wider variety of choices for consumers.

5. Infrastructure Development: The NIP also recognized the critical role of infrastructure in facilitating industrial growth and attracting foreign investment. Efforts were made to attract private participation in various infrastructure sectors, including:

- **Telecommunications:** The telecom sector witnessed phenomenal growth due to the entry of private players like Bharti Airtel and Reliance Jio, leading to a dramatic drop in call rates and improved connectivity across the country.
- **Ports and airports:** Private companies were invited to operate and manage ports and airports, leading to increased efficiency and modernization of these facilities.

However, challenges remain in other sectors like roads and power. While public-private partnerships have been explored in road construction, the pace of progress has been slow. The power sector has been plagued by financial problems and distribution inefficiencies, hindering private investment.

Performance of The Private Sector Under The New Industrial Policy (NIP)

The NIP's focus on unleashing the potential of the private sector has yielded mixed results, with both undeniable successes and lingering challenges:

Success Stories

- **Enhanced Innovation and Competitiveness:** Several industries, particularly those exposed to global competition, have shown remarkable growth and innovation. Examples include:
  - **Pharmaceuticals:** Indian pharma companies have become global leaders in generics and are increasingly foraying into high-value segments like biosimilars.
  - **Information Technology (IT):** India has emerged as a global IT hub, boasting of tech giants like Infosys and Tata Consultancy Services. This has not only driven exports but also fueled the growth of other sectors like e-commerce and digital services.
  - **Automobiles:** Foreign investments and collaborations have transformed the Indian auto industry, producing world-class vehicles and making India a major player in the global market.
  - **Increased Efficiency and Productivity:** The increased competition and market discipline introduced by the NIP have forced many private companies to become more efficient and cost-conscious. This has led to better product quality, higher productivity, and lower prices for consumers.
  - **Job Creation and Economic Growth:** The expansion of the private sector has been a significant driver of job creation, contributing to rising incomes and poverty reduction. This has fueled domestic demand and spurred overall economic growth.

Challenges and Concerns

- **Uneven Participation and Inequality:** While certain sectors have thrived, others, particularly traditional industries like textiles and agriculture, have struggled to adapt. This has led to uneven growth and concerns about widening income inequality between different segments of the population.
- **Concentration of Power and Market Manipulation:** In some sectors, the entry of large private players has resulted in the formation of oligopolies or dominant market positions, raising concerns about unfair competition and potential exploitation of consumers.
- **Social and Environmental Concerns:** The focus on rapid growth has sometimes come at the cost of environmental degradation and social displacement. Ensuring sustainable development and balancing economic gains with social and environmental responsibility remains a crucial challenge.

Moving Forward

The NIP has undoubtedly unleashed the potential of the private sector and contributed significantly to India's economic growth. However, addressing the remaining challenges and ensuring inclusive and sustainable development requires continued efforts in the following areas:

- **Targeted interventions and support for struggling sectors:** Providing assistance to traditional industries in upgrading technology and adapting to the changing market dynamics.
- **Strengthening competition law and regulatory frameworks:** Preventing anti-competitive practices and ensuring a level playing field for all businesses.
- **Investing in social infrastructure and environmental protection:** Balancing economic growth with social concerns and promoting sustainable development practices.
- **Promoting skill development and entrepreneurship:** Equipping the workforce with the necessary skills to thrive in the evolving job market and fostering entrepreneurship to create new opportunities.

By addressing these challenges and continuously adapting to the changing global landscape, India can fully capitalise on the potential of the private sector and achieve inclusive and sustainable economic growth in the years to come.

DISINVESTMENT

Indian state-owned firms (PSUs/PSEs) played a significant role in development. However, by 1991, their efficiency waned. Disinvestment was adopted as a reform tool to:

- Improved public sector performance
- Deregulate industries
- Raise budgetary resources

India pursued a cautious approach, avoiding mass closures or selling off struggling entities. Disinvestment efforts began in 1991 with the Rangarajan Commission's (Commission on Disinvestment of Public Sector Enterprises (1991)) guidance. Dedicated government bodies were established to accelerate the process, but later dismantled. Today, disinvestment falls under the Ministry of Finance.

Types of Disinvestments

Since the commencement of the disinvestment process in India in 1991, it has been characterised by two official types. Here's a brief overview of each:

1. Token Disinvestment

The initiation of disinvestment in India began with significant political caution, symbolically known as token disinvestment (now referred to as 'minority stake sale').

- The general policy aimed to sell up to 49% of the shares of Public Sector Undertakings (PSUs), maintaining government ownership of the companies. In practice, however, shares were typically sold up to 5-10%.
- While this phase of disinvestment generated additional funds for the government (utilised to address the fiscal deficit as 'capital receipts'), it did not introduce any new elements to enhance the efficiency of PSUs.
- This became a major criticism, with experts worldwide suggesting that the government should consider transferring ownership from the government to the private sector. Another significant concern raised by experts related to the utilisation of disinvestment proceeds.

2. Strategic Disinvestment

To transform disinvestment into a process that could enhance PSU efficiency and relieve the government of activities where the private sector demonstrated better efficiency, the government initiated the process of strategic disinvestment.

- In March 1999, the government classified PSUs into strategic and non-strategic categories, announcing its intent to generally reduce its stake in non-strategic Public Sector Enterprises (PSEs) to 26% or below if necessary.
- In strategic PSEs (e.g., arms and ammunition, atomic energy, railways), the government would retain its majority holding.
- This marked a significant shift in disinvestment policy from selling small shares in profit-making PSUs (token disinvestment) to strategic sales involving a change in management control, applicable to both profit and loss-making enterprises.

The **essence of strategic disinvestment** was

1. The disinvestment will involve **divesting a minimum of 51% of shares.**
2. The sale of shares will be conducted in collaboration with a strategic partner possessing international-class experience and expertise in the sector.

This form of disinvestment was initiated with Modern Food Industries Ltd (MFIL). The second Public Sector Undertaking (PSU) was BALCO. Other PSUs included CMC Ltd, HTL, IBPL, VSNL among others. The new government at the Centre temporarily suspended this policy of strategic disinvestment and introduced a new one.

Disinvestment Policy

India's disinvestment policy has evolved since its initiation in 1991, comprising two key elements: the underlying ideology and the policy itself. The ideological principles include:

1. Promotion of public ownership of Public Sector Undertakings (PSUs) as national assets.
2. Government retention of a minimum of 51% shares in the case of 'minority stake sale.'
3. Potential sale of up to 50% or more shares under "strategic disinvestment."

The current disinvestment policy implemented by the government is outlined below:

1. Minority Stake Sale (Policy from November 2009 Continues)

- Listed PSUs to be considered first to comply with the minimum 25% listed norm, provided they have earned a net profit in the three preceding consecutive years.
- 'Follow-on' public offers on a case-by-case basis when additional capital investment is required.
- The Department of Investment and Public Asset Management (DIPAM) identifies PSUs and suggests disinvestment in consultation with respective ministries.

2. Strategic Disinvestment (Announced in February 2016)

- To be executed through consultation among Ministries/ Departments and NITI Aayog.
- NITI Aayog identifies PSUs and advises on various aspects.
- The Core Group of Secretaries on Disinvestment (CGD) considers recommendations from NITI Aayog to facilitate decisions by the Cabinet Committee on Economic Affairs (CCEA) and supervise/monitor the implementation process.

Current Policy (Union Budget 2021-22)

The disinvestment policy underwent further adjustments by the Government in the Union Budget 2021-22, reshaping its objectives and features in the process of gradual evolution:

Objectives of The Policy

1. Reduce the presence of Central Public Sector Enterprises (CPSEs), including financial institutions (FIs), and open up new investment opportunities for the private sector.
2. Facilitate post-disinvestment economic growth of CPSEs and FIs through the infusion of private capital, technology, and best management practices.

3. Utilise disinvestment proceeds to fund various social sector and developmental programs.

Policy Features:

1. The policy encompasses existing CPSEs, Public Sector Banks, and Public Sector Insurance Companies.
2. Different sectors will be categorised as strategic and non-strategic sectors.
3. The identified strategic sectors include:
   a. Atomic energy, Space, and Defence
   b. Transport and Telecommunications
   c. Power, Petroleum, Coal, and other minerals
   d. Banking, Insurance, and financial services
4. Strategic sectors will maintain a minimal presence of CPSEs, with the remaining entities either privatised, merged or subsidiaries with other CPSEs, or closed.
5. In non-strategic sectors, CPSEs will be privatised or closed.

Comprehensive Management of Public Assets

Since 2016, disinvestment has been integrated into a broader policy known as the comprehensive management of government investments in public assets. Before introducing the current disinvestment policy, the Government renamed the existing **Department of Disinvestment to the Department of Investment and Public Asset Management (DIPAM)** and expanded its mandate from solely overseeing disinvestment to the comprehensive management of the Government's investment in Central Public Sector Enterprises (CPSEs).

The following four actions are envisaged under this approach:

1. Achieving optimal returns and accelerating growth.
2. Leveraging assets through capital and financial restructuring.
3. Enhancing investors' confidence through exposure to the capital market.
4. Rationalising the decision-making process for efficient management.

National Monetisation Pipeline (NMP)

The National Monetisation Pipeline (NMP) is a crucial initiative launched by the Indian government in 2021 to unlock long-term, sustainable funding for infrastructure development.

What is it?

- A medium-term roadmap for monetizing brownfield infrastructure assets across various sectors like roads, railways, airports, ports, power, telecom, warehousing, and more.
- Aims to raise ₹ 6 lakh crore over four years (FY 2022-25) through various modes of monetization like:
- **Concessions:** Leasing out operational assets for a fixed period to private entities who will manage and operate them.
- **Tolling:** Optimising and monetizing existing or upcoming toll roads and highways.
- **Investment Trusts (Invits):** Raising funds by pooling assets and offering units for investment.
- **Asset sales:** Direct sale of partial or complete ownership in select assets.

Why is it important?

- Addresses the need for additional funding to boost infrastructure development and growth.
- Leverages private sector expertise and capital to improve efficiency and performance of existing infrastructure.
- Generates a steady stream of income for the government to reinvest in critical areas like healthcare, education, and social welfare.

Proceeds of Disinvestment: Debating The Utilisation

The year following the initiation of disinvestment sparked a nationwide discussion on how to appropriately allocate the proceeds of disinvestment—money accruing to the government from the sale of shares in PSUs. This debate has progressed through three phases:

- **Phase I (1991-2000):** During this period, the funds obtained through disinvestment were primarily utilised to meet budgetary requirements, effectively bridging fiscal deficit gaps.
- **Phase II (2000-03):** This brief phase witnessed two key developments. Firstly, the government began using proceeds not only to address fiscal deficit needs but also for other beneficial purposes, including reinvestment in PSEs, prepayment of public debt, and social sector initiatives. Secondly, a consensus emerged on a proposal by the Finance Minister at the time, suggesting diverse uses for disinvestment proceeds:
  1. Upgrading the divested PSU itself.
  2. Facilitating the turnaround of other PSUs.
  3. Repaying/pre-paying public debt.
  4. Investing in social infrastructure (education, healthcare, etc.).
  5. Supporting the rehabilitation of the labour force of divested PSUs.
  6. Meeting budgetary requirements.
- **Phase III:** Notable developments in this phase include:
  1. **National Investment Fund (NIF)**: Instituted in January 2005, the NIF featured the following aspects:
     - Proceeds from disinvestment would flow into the NIF, maintained outside the Consolidated Fund of India.
     - The NIF's corpus would be of a permanent nature.
     - Professional management by selected Public Sector Mutual Funds (UTI Asset Management

Company Ltd, SBI Funds Management Company Pvt. Ltd, LIC Mutual Fund Asset Management Company Ltd).

- 75% of the annual income would finance selected social sector schemes, promoting education, health, and employment.
- The remaining 25% of the annual income would be used to meet the capital investment requirements of profitable and revivable PSUs, enlarging their capital base for expansion/diversification.

The NIF's income contributed to various social sector schemes, including the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), Accelerated Irrigation Benefits Programme (AIBP), Rajiv Gandhi Gram Vidyutikaran Yojana (RGGVY), Accelerated Power Development and Reform Programme, Indira Awas Yojana, and the National Rural Employment Guarantee Scheme (NREGS).

2. **Revamping NIF Structure:** In November 2009, the government sanctioned a modification to the disinvestment proceeds utilisation policy. Faced with challenges stemming from the global economic downturn in 2008-09 and a severe drought in 2009-10, a one-time exemption was granted for depositing disinvestment proceeds into NIF. This exemption was applicable for the fiscal years 2009-12, later extended to 2012-13 due to the sustained economic challenges. During this three-year span, all disinvestment proceeds (instead of the income generated from the NIF corpus investment) were earmarked for selected social sector schemes.
3. **Current Policy:** In January 2013 (further revised in February 2013), the government sanctioned the restructuring of the National Investment Fund (NIF). The decision was made to credit disinvestment proceeds from the fiscal year 2013-14 to the existing Public Account under the NIF. These funds would remain there until withdrawal or investment for approved purposes as decided by the Union Budget.

   The NIF was designated for the following purposes:

   - Subscribing to shares issued by CPSEs, including PSBs and public sector insurance companies, on a rights basis to maintain 51% government ownership.
   - Preferential allotment of shares of CPSEs to promoters, ensuring government shareholding remains above 51% when CPSEs raise fresh equity for their CAPEX programs.
   - Recapitalization of public sector banks and insurance companies.
   - Government investment in RRBs, IFCL, NABARD, Exim Bank.
   - Equity infusion in various metro projects.
   - Investment in Bharatiya Nabhikiya Vidyut Nigam Limited and Uranium Corporation of India Ltd.
   - Investment in Indian Railways for capital expenditure.

   This flexible policy on disinvestment proceeds continues to finance various social sector and developmental programs of the government, as per the Union Budget for 2021-22 (and continues for 2022-23).

Targets of Proceeds

Proceeds from disinvestment are categorised as **"non-debt Capital Receipts"** for the Government, creating no liabilities. Hence, they have become an appealing source of funds for the government to finance budgetary allocations. The government has set increasing targets for proceeds in recent years, with a target of ₹ 65,000 crores for 2022-23, as per the Union Budget 2022-23 (notably, the target for 2021-22 was revised downward to ₹ 78,000 crores from ₹ 1.75 lakh crores).

PUBLIC SECTOR UNDERTAKINGS

Public Sector Undertakings (PSUs) are government-owned companies where the government, at the Union or the state level, or both own a majority stake of 51% or more of the company equity. Some of the well-known PSUs are Bharat Heavy Electrical Limited (BHEL), Steel Authority of India Limited (SAIL), and Gas Authority of India Limited (GAIL).

After independence, various financial and socio-economic issues emerged such as income gap, increased unemployment, imbalance in regional economic growth, etc. Therefore, the public sector was seen as the key driver of growth in a planned economic development approach.

The formation of Capital Goods Industries was one of the greatest driving forces behind the establishment of PSUs.

Objectives of Public Sector Undertakings

- PSUs invest in key sectors of the economy, such as infrastructure, manufacturing, and services. These sectors play a key role in employment generation and economic growth.
- PSUs provide essential services to people, which the private sector may not venture into, due to inadequate demand or profits.
- PSUs invest in less developed regions to help reduce regional disparities.
- PSUs help reduce India's dependence on imports by producing goods and services domestically. This can make the Indian economy more resilient to external shocks.

Classification of Public Sector Undertakings

Public Sector Undertakings (Psu) can be Classified into Following Three Categories

- **Central public-sector Enterprises (CPSEs):** Companies under the direct control of the Central Government or of other CPSEs by 51% or more than 51% of capital share ownership. These can be further classified into **Strategic CPSEs and Non-strategic CPSEs.**

- **Strategic Central Public-sector Enterprises (CPSEs):** These include Arms and ammunition, and other items related to Defense, and in the field of atomic energy and Railways transport.
- **The rest of the CPSEs are regarded as Non-strategic CPSEs.**
- **Public Sector Banks (PSBs):** Banks under the direct control of the Central Government or of other PSBs by 51% or more than 51% of capital share ownership.
- **State-Level Public Enterprises (SLPEs):** Companies under the direct control of any State Government or other SLPEs by 51% or more than 51% of capital share ownership.

Concept of Maharatna, Navratna and Miniratna Companies

The terms Maharatna, Navratna, and Miniratna are used to categorise Central Public Sector Enterprises (CPSEs) in India based on their financial performance and operational autonomy. This classification impacts the decision-making power and flexibility granted to these companies.

Maharatna

- **Top tier:** The most prestigious category, encompassing CPSEs with exceptional financial performance, global competitiveness, and strategic importance.
- **Financial criteria:** To qualify, a company must have:
  - Net worth exceeding ₹ 15,000 crore for the last three years.
  - Average turnover exceeding ₹ 25,000 crore for the last three years.
  - Operating profit exceeding ₹ 5,000 crore for the last three years.
- **Autonomy:** Maharatnas enjoy the highest level of autonomy, allowing them to:
  - Invest up to ₹ 5,000 crore without government approval.
  - Form joint ventures abroad without needing prior clearance.
  - Raise resources for their projects through various means.
- **Examples:** Coal India Limited, Indian Oil Corporation, Oil and Natural Gas Corporation Ltd.

Navratna

- **Mid-tier:** A step below Maharatnas, comprising CPSEs with strong financial performance and significant contributions to the economy.
- **Financial criteria:** To qualify, a company must have:
  - The CPSEs which are Miniratna I, Schedule 'A' and have obtained 'excellent' or 'very good' MOU rating in three of the last five years and having composite score of 60 or above in following six selected performance indicators are eligible to be considered for grant of Navratna status.
    1. Net Profit to Net worth : 25
    2. Manpower Cost to total Cost of Production or Cost of Services : 15
    3. PBDIT to Capital employed : 15
    4. PBIT to Turnover : 15
    5. Earning Per Share : 10
    6. Inter Sectoral Performance : 20
  - Operating profit exceeding ₹ 300 crore for the last three years.
- **Autonomy:** Navratnas have a wider range of operational powers compared to other CPSEs, including:
  - Investing up to ₹ 1,000 crore without government approval.
  - Entering joint ventures or mergers without prior clearance for most projects.
- **Examples:** Bharat Heavy Electricals Limited, Bharat Petroleum Corporation Limited, Power Grid Corporation of India Ltd.

Miniratna

- **Two sub-categories:** Further divided into Miniratna Category I and Category II based on financial performance and operating autonomy.
- **Miniratna Category-I status:** The CPSEs which have made profit in the last three years continuously, pre-tax profit is ₹ 30 crores or more in at least one of the three years and have a positive net worth are eligible to be considered for grant of Miniratna-I status.
- **Miniratna Category-II status:** The CPSEs which have made profit for the last three years continuously and have a positive net worth are eligible to be considered for grant of Miniratna-II status.
- **Autonomy:** Both categories have some level of financial decision-making power, including capital expenditure approval for smaller projects without government intervention.
- **Examples:** Indian Railway Construction Company Ltd. (Category I), Hindustan Aeronautics Limited (Category II).

Overall, the Maharatna, Navratna, and Miniratna classification system empowers successful CPSEs with greater autonomy and encourages them to become global leaders while driving economic growth and national development.

Performance of CPSEs

India's approach to Central Public Sector Enterprises (CPSEs) has undergone a dramatic transformation. The 2020 CPSE policy marks a decisive shift from the Mahalanobis Plan's focus on import substitution and self-sufficiency (1956) that underpinned CPSE creation.

Driven by inherent inefficiencies, low productivity, high costs, and strained public finances, post-1991 saw a wave of privatisation and disinvestment. This journey to reduce government presence in commercial activities through stock market sales and strategic partnerships has been a matter of ongoing deliberation, as evidenced by discussions in Economic Surveys from 2000-03.

The "Atma Nirbhar Bharat Mission" (Self-reliant India) further accelerates this shift. It proposes rationalising CPSE participation in commercial activities, limiting their presence to just four strategic sectors. Others will be either merged, privatised, or brought under holding companies. This strategy aims to:

- Inject healthy competition into non-strategic sectors
- Enable the government to focus heavily on strategic sectors
- To improve the performance of retained CPSEs, the 2020-21 Economic Survey suggests additional reforms:
  1. Revamping Boards and Structures: Streamlining governance and decision-making.
  2. Enhanced Operational Autonomy: Empowering Boards while upholding strong corporate governance norms.
  3. Stock Exchange Listing: Increasing transparency and accountability.

Beyond disinvestment and rationalisation, other recent initiatives include:

- **Revamping Performance Monitoring:** Introducing a more objective, forward-looking system based on sectoral benchmarks.
- **Closure of Unprofitable Enterprises:** Resolving the burden of loss-making entities.
- **Asset Disposal:** Optimising resource allocation through strategic asset monetization.

This comprehensive approach marks a significant evolution in India's CPSE policy. It seeks to unlock a more competitive and efficient economy while optimising the remaining state-owned sector for strategic national interests.

INDEX OF INDUSTRIAL PRODUCTION

The Index of Industrial Production data or IIP as it is commonly called, is an index that tracks manufacturing activity in different sectors of an economy. It is a composite indicator that measures the short-term changes in the volume of production of a basket of industrial products during a given period.

The IIP data is compiled and published monthly by the National Statistical Office (NSO) and is released with a time lag of six weeks.

IIP index is currently calculated using 2011-2012 as the base year.

Base Year 2011-12	Index of Industrial Production (IIP)		
	Mining	Manufacturing	Electricity
Weights	14.373	77.633	7.94

The eight core industries which comprise 40.27% of the weight of items included in the Index of Industrial Production, are compiled and published by the Ministry of Commerce and Industry and come with a time lag of one month.

Current Trends in Index of Industrial Production. The Index of Industrial Production and its growth rates with base year 2011-12 for the last three years was:

Year	2019-20	2020-21	2021-22
Index	129.0	118.1	131.6
Growth Rate (%)	–0.8	–8.4	11.4

The **years 2019-20 and 2020-21 were impacted due to Covid-19 Pandemic** and the resultant restrictions. However, the IIP has recovered its position and the index now stands at 131.6, the highest in the last decade (PIB Data).

INDEX OF EIGHT CORE INDUSTRIES

In the Index of Industrial Production, eight sectors are considered the Core Sectors. These industries have a major impact on general economic activities and also other industrial activities. These comprise 40.27% of the weight of items included in the Index of Industrial Production (IIP).

The Eight core sector industries in decreasing order of their weightage:

Refinery Products > Electricity > Steel > Coal > Crude Oil > Natural Gas > Cement > Fertilisers

LABOUR LAWS IN INDIA

In the context of the **Indian Constitution**, labour is a **concurrent subject**. The Central Government has enacted a total of **44 labour laws,** with each state having its own set. These laws were formulated during the pre-independence era, aligning with an import-substitution and statist model of economic development. While the intention behind creating these labour laws was commendable, the evolving economic landscape has rendered them obsolete. The current need is for new laws that prioritise safety standards, address basic worker needs, ensure welfare, and are adaptable enough to foster job creation rather than hinder it.

Employment Statistics (2021-22)

- **Total Labor Force:** 56 crore
- **Employed:** 53.5 crore
- **Formal Employment:** 9.55 crore (11%)
- **Informal Employment:** 43.99 crore (89%)

Challenges with Existing Laws and Economic Impact

- **Rigidity and Complexity:**
  - **Multiple laws:** India has a complex web of over 40 central and state-level labour laws, often overlapping and creating confusion for both employers and employees.
  - **Rigid regulations:** Stringent compliance requirements and limited flexibility in areas like hiring, firing, and working hours can discourage investment and job creation.
  - **Complex dispute resolution:** Lengthy and bureaucratic processes for resolving labour disputes can be time-consuming and costly for both parties.
- **Impact on Competitiveness:**
  - **High compliance costs:** The burden of adhering to numerous regulations can translate into higher hiring costs for businesses, making them less competitive globally.
  - **Discouragement of formalization:** Complexities can incentivize businesses to operate informally, depriving workers of legal protections and hindering tax revenue collection.
  - **Limited flexibility:** Rigidities in labour laws make it difficult for businesses to adapt to changing market conditions and technological advancements.
- **Challenges for specific groups:**
  - **Impact on youth employment:** Strict hiring regulations and lack of apprenticeship programs can make it difficult for young people to enter the workforce.
  - **Informal sector:** The vast informal sector remains excluded from the benefits of labour laws, leaving millions of workers vulnerable.
  - **Gender disparity:** Gender gaps in wages and limited protection for women at workplaces remain challenges.

NEW LABOUR CODES

The new labour codes, consolidated from **29 existing laws into four**, are set to be enacted shortly.

1. The Code on Wages, 2019: Key Provisions

Key Objectives

- **Simplify and consolidate:** Unifies 40+ central labour laws related to wages, bonuses, and allowances into a single code.
- **Streamline minimum wages:** Establishes a national floor-level wage and a common set of definitions for calculating wages across industries.
- **Enhance social security:** Mandates payment of minimum wages through bank accounts or electronic means for better transparency and social security benefits.
- **Facilitate timely payments:** Sets deadlines for payment of wages and penalties for delayed payments.
- **Promote gender equality:** Mandates equal pay for equal work for both men and women.

Key Provisions

- **National floor-level wage:** Sets a minimum wage applicable across India, with states empowered to set higher rates based on local conditions.
- **Unified wage definitions:** Specifies components of wages, including basic pay, dearness allowance, and retaining allowance.
- **Transparency in wage payments:** Requires detailed wage slips for employees, outlining all components.
- **Timely payment of wages:** Employers must pay wages within a specified timeframe, usually within two working days of the end of the wage period.
- **Overtime compensation:** Mandates overtime pay at a rate of twice the regular hourly wage.
- **Equal pay for equal work:** Prohibits wage discrimination based on gender for the same or similar work.

2. The Occupational Safety, Health and Working Conditions Code, 2020

Key Objectives

- **Consolidate and simplify:** Unifies 13 central labour laws related to occupational safety, health, and working conditions into a single code.
- **Enhance worker safety:** Establishes a comprehensive framework for ensuring safe and healthy working environments across industries.
- **Promote standardisation:** Sets common standards for health, safety, and welfare measures at workplaces.
- **Strengthen enforcement:** Empowers inspectors with stronger powers to enforce safety regulations and penalise violations.
- **Encourage worker participation:** Mandates the formation of safety committees with worker representation.

Key Provisions

- **Safety committees:** Requires establishments with 20 or more workers to form safety committees with equal representation from employers and employees.
- **Risk assessment and mitigation:** Mandates employers to conduct risk assessments, implement control measures, and provide safety training to workers.
- **Working hours:** Regulates working hours, including daily and weekly limits, overtime, and breaks.
- **Leave entitlements:** Specifies various leave entitlements for workers, such as annual leave, sick leave, and maternity leave.

- **Special provisions for women:** Prohibits night shifts for women in certain industries, mandates childcare facilities, and provides additional benefits for pregnant and nursing women.
- **Contract labour:** Regulates the employment of contract labour, ensuring equal protection and benefits for contract workers.
- **Grievance redressal:** Establishes mechanisms for workers to raise safety concerns and seek redressal.

3. The Social Security Code of 2020

Key Objectives

- **Consolidation:** Merge nine existing laws into a single code, simplifying access to information and reducing administrative burden.
- **Extension of coverage:** Broaden the scope of social security benefits to encompass employees and workers across sectors, including the unorganised sector.
- **Flexibility and portability:** Introduce provisions for easier transfer of social security benefits when switching jobs or moving locations.
- **Improved administration:** Enhance the efficiency and transparency of social security administration through centralised systems and technology.
- **Fiscal sustainability:** Ensure long-term financial viability of social security schemes through efficient fund management and resource mobilisation.

Key Features

- **National Social Security Board and State Unorganised Workers' Board:** Creates dedicated bodies to manage social security for unorganised workers and provide them with access to schemes like pension and health insurance.
- **Universal coverage:** Envisions extending social security benefits to all workers, irrespective of their sector or wage level.
- **Contribution reforms:** Streamlines contribution rates and payment methods for employers and employees.
- **Benefits rationalisation:** Simplifies and standardises various social security benefits like health care, pensions, and maternity leave.
- **Technological integration:** Promotes the use of technology for efficient administration and transparency in managing social security schemes.

4. Industrial Relations Code, 2020

Key Objectives

- **Consolidation:** Unifies three central labour laws related to trade unions, industrial disputes, and standing orders into a single code.
- **Promote ease of doing business:** Seeks to reduce regulatory burden on businesses and facilitate smoother industrial relations.
- **Encourage flexibility:** Introduces provisions for fixed-term employment and easier retrenchment of workers in certain conditions.
- **Streamline dispute resolution:** Aims to expedite settlement of industrial disputes through mechanisms like conciliation and arbitration.
- **Enhance worker participation:** Mandates the formation of worker committees in establishments with 100 or more workers.

Key Provisions

- **Trade unions:** Sets guidelines for registration and functioning of trade unions, including membership requirements and financial transparency.
- **Strikes and lockouts:** Regulates the process of strikes and lockouts, requiring notice periods and mandating conciliation efforts before taking action.
- **Retrenchment:** Allows employers to retrench workers with prior notice and payment of compensation in certain conditions, such as economic downturns or technological changes.
- **Fixed-term employment:** Permits hiring workers on fixed-term contracts for up to one year, with extensions up to three years.
- **Grievance redressal:** Establishes mechanisms for workers to raise grievances and seek redressal through internal committees and external authorities.
- **Worker participation:** Mandates the formation of worker committees to promote dialogue and consultation between employers and employees.

Potential Benefits

- **Ease of doing business:** Simplified regulations and reduced compliance burden could attract investments and boost job creation.
- **Formalization of workforce:** Bringing informal workers under the code's ambit could increase social security coverage and tax revenue.
- **Flexibility and adaptability:** Changes in hiring, firing, and working hours could help businesses adapt to market changes and technological advancements.
- **Improved dispute resolution:** Streamlined dispute resolution mechanisms could expedite settlements and reduce litigation costs.

Challenges and Concerns

- **Implementation gaps:** Effective implementation across states and sectors remains a challenge, necessitating capacity building and awareness campaigns.
- **Worker rights dilution:** Concerns exist about potential weakening of worker protection in areas like firing regulations and fixed-term contracts.
- **Trade union concerns:** Reforms related to trade unions and strikes raise concerns about worker representation and bargaining power.

- **Informal sector integration:** Challenges remain in effectively integrating informal workers into the formal system, with concerns about access and affordability of social security benefits.

MICRO SMALL AND MEDIUM ENTERPRISES (MSME)

The economic progress of a nation is intricately linked to the advancement of its industrial sector, encompassing Large, Medium, Small, and Micro enterprises. While large industries contribute significantly to overall economic development, the role of MSMEs is paramount in fostering employment, industrial production, and exports. MSMEs leverage labour intensiveness, cost-effective technology, modest capital investment, short gestation periods, and robust linkages with other sectors.

The following facts highlight the **significance of MSMEs:**

- MSMEs contribute 45% to manufacturing output/ GDP.
- MSMEs contribute 40% to exports.
- The MSME sector comprises around 6.34 crore enterprises (with 90% being informal), employing over 11 crore workers.

Micro, Small, and Medium Enterprises Development (MSMED) Act of 2006

Enacted in 2006, the MSMED Act was introduced to tackle policy challenges impacting Micro, Small, and Medium Enterprises (MSMEs), addressing issues related to sector coverage and investment ceilings. The primary aim of the Act is to promote and foster the growth of these enterprises while boosting their competitive edge. It establishes a groundbreaking legal framework for acknowledging the "enterprise" concept, encompassing both manufacturing and service-oriented entities. Recent modifications have led to a revised classification and definition of MSMEs.

Classification	Micro	Small	Medium
Manufacturing and Services	Investment < 1 cr and Tumover < 5 cr	Investment < 10 cr and Turnover < 50 cr	Investment < 50 cr and Turnover < 250 cr

Moreover, the turnover related to exports will not be included in the turnover thresholds for any MSME category, be it Micro, Small, or Medium. This measure aims to expand the coverage of MSME classification, allowing more units to be included, irrespective of their export volumes.

Challenges

While holding significant potential to tackle structural issues such as unemployment, regional imbalances, and unequal distribution of national income, the MSME sector encounters numerous challenges. The **primary impediments** faced by this sector include:

- Insufficient and untimely access to banking finance
- Limited capital and knowledge resources
- Lack of access to suitable technology
- Constrained production capacity, hindering the exploitation of economies of scale
- Ineffective marketing strategies
- Barriers to modernization and expansion efforts
- Scarcity of skilled labour at affordable costs
- Necessity to engage with various government agencies for payment and issue resolution

National Small Industries Corporation Limited (NSIC)

- NSIC, established in 1955, is headed by Chairman-cum-Managing Director and managed by a Board of Directors.
- The main function of the Corporation is to promote, aid and foster the growth of micro and small enterprises in the country, generally on commercial basis.
- NSIC provides a variety of support services to micro and small enterprises catering to their different requirements in the areas of raw material procurement; product marketing; credit rating; acquisition of technologies; adoption of modern management practices, etc.

Government's Role in Promoting The MSME Sector

A significant portion of the rural population derives its sustenance from agriculture and related activities. While these sectors are vital, achieving a well-rounded and inclusive economic growth for India necessitates the development of industries and services. The socio-economic policies implemented by the Indian government, starting with the **Industries (Development and Regulation) Act, 1951**, have emphasised the crucial role of Micro, Small, and Medium Enterprises (MSMEs) in enhancing the nation's economic landscape.

Promotion and Development of MSMEs

Here are some of the recent initiatives introduced by the Government of India to promote and develop Micro, Small, and Medium Enterprises (MSMEs):

- **Udyam Registration Number:** MSMEs can complete a concise one-page registration form, serving as a self-declaration format. This allows MSMEs to self-certify their details, such as existence, bank account information, promoter/owner's Aadhaar details, and other basic information. Upon completion, MSMEs receive a unique identifier called the "Udyam Registration Number." This

number enables MSMEs to access information and apply online for various services offered by Ministries and Departments.

- **Raising and Accelerating MSME Performance (RAMP):** This scheme focuses on:
  - Strengthening institutions and governance at both the central and state levels.
  - Enhancing collaborations between the central and state governments.
  - Improving MSMEs' access to markets and credit.
  - Facilitating technology upgrades.
  - Addressing issues related to delayed payments.
  - Promoting environmental sustainability in MSMEs.

Schemes Implemented by The Ministry of MSME and its Organisations

- Prime Minister's Employment Generation Programme (PMEGP)
- 2nd Loan for up-gradation of the existing PMEGP/ MUDRA units
- Credit Guarantee Scheme for Micro & Small Enterprises (CGTMSE)
- Micro & Small Enterprises Cluster Development Programme (MSE-CDP) Scheme
- Scheme of Fund for Regeneration of Traditional Industries (SFURTI)
- National SC-ST Hub Scheme
- Entrepreneurship Skill Development Programme (ESDP) Scheme
- Assistance to Training Institutions (ATI) Scheme
- Coir Vikas Yojana

New Schemes

- Tool Rooms and Technical Institutions - A Component of Infrastructure Development & Capacity Building scheme
- MSME Champions Scheme
- MSME Sustainable (ZED) Certification
- MSME- Innovative (Incubation, IPR and Design)
- Credit Guarantee Scheme for Subordinate Debt (CGSSD) for Stressed MSMEs
- Self Reliant India (SRI) Fund

- **Aspire:** The Government has initiated the Scheme for Promoting Innovation and Rural Entrepreneurs (ASPIRE). Its goal is to establish a network of technology and incubation centers to foster entrepreneurship, encourage start-ups, and drive innovation in rural and agriculture-based industries.
- **Employment Exchange:** The Employment Exchange for Industries has been launched to facilitate matchmaking between potential job seekers and employers.

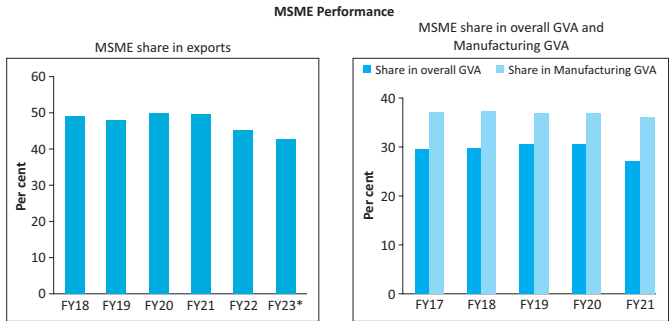


Fig. 15.1

- **Framework for Revival and Rehabilitation:** The government has established a framework for the revival and rehabilitation of MSMEs.
- **Faster Access to Credit:** MSMEs can obtain in-principle approval for working capital and term loans ranging from ₹ 1 lakh to ₹ 1 crore in just 59 minutes.
- The **Samadhaan Portal**, launched by the government under the MSMED Act, tracks and resolves the pending payments to MSMEs. As of 7th January 2022, the portal has processed 41.9 percent of the 1.3 lakh applications received.
- **CHAMPIONS:** The CHAMPIONS online platform, launched in May 2020, provides support to MSMEs throughout their business lifecycle. CHAMPIONS, which stands for Creation and Harmonious Application of Modern Processes for Increasing the Output and National Strength, serves as an ICT-based technology system offering a single-window solution for various MSME needs.
- **Change in Definition of MSMES:** MSMEs can now expand their business with a turnover of up to ₹ 250 crore (and investment up to ₹ 50 crore) while still enjoying the benefits of being categorised as MSMEs.
- **Atma Nirbhar Bharat Schemes:** Several schemes, including Distressed MSME Funds, Fund of Funds (Mother Funds), and the Emergency Credit Line Guarantee Scheme, have been launched under Atma Nirbhar Bharat.

The **UK Sinha Committee** and **K V Kamath Committee** have proposed various reforms for MSMEs.

Coir Board

The Coir Board is a **statutory body** established under the **Coir Board Industry Act, 1953** (NO. 45 of 1953) for promoting overall development of the coir industry and improving the living conditions of the workers engaged in this traditional industry.

The Coir Board consists of a full-time Chairman and 39 part-time Members. The activities of the Board for development of coir industries, inter-alia include

- undertaking scientific, technological and economic research and development activities;

- collecting statistics relating to exports and internal consumption of coir and coir products;
- developing new products and designs;
- organising publicity for promotion of exports and internal sales;
- marketing of coir and coir products in India and abroad;
- preventing unfair competition between producers and exporters; assisting the establishment of units for manufacture of the products;
- promoting co-operative organisation among producers of husks, coir fibre, coir yarn and manufacturers of coir products; ensuring remunerative returns to producers and manufacturers, etc.

The Board has promoted two research institutes namely, **Central Coir Research Institute (CCRI), Kalavoor, Alleppey,** and **Central Institute of Coir Technology (CICT), Bengaluru** for undertaking research activities on different aspects of coir industry which is one of the major agro based rural industries in the country. The two major strengths of the coir industry are it being export oriented and generating wealth out of the waste (coconut husk).

NATIONAL INVESTMENT AND MANUFACTURING ZONE (NIMZ)

NIMZs stand out as crucial components of the **National Manufacturing Policy, 2011.**

They are conceptualised as **expansive parcels of developed land** equipped with the necessary ecosystem to foster top-tier manufacturing activities. NIMZs are designed as Integrated Industrial Townships, featuring cutting-edge infrastructure, zoned land use, energy-efficient technology, essential social infrastructure, and skill development facilities. The goal is to create a supportive environment for individuals transitioning from the primary sector to the secondary and tertiary sectors.

NIMZs distinguish themselves from Special Economic Zones (SEZs) in terms of size, the extent of infrastructure planning, governance structures governing regulatory procedures, and exit policies. The main objective of Special Economic Zones is promotion of exports, while NIMZs are based on the principle of industrial growth in partnership with States and focuses on manufacturing growth and employment generation

Key features of proposed NIMZs include:

- The **state government** is responsible for providing appropriate land spanning 5,000 hectares.
- A **minimum of 30% of the total area** is allocated for the establishment of manufacturing units.
- A special-purpose vehicle is constituted to manage the affairs of the NIMZ.
- The central government extends financial support, capped at 20% of the project cost.
- The central government is committed to enhancing or providing external physical infrastructure linkages to NIMZ, encompassing railroad, airport, and telecommunication, within specified timelines.

So far, three NIMZs namely Prakasam (Andhra Pradesh), Sangareddy (Telangana) and Kalinganagar (Odisha) have been accorded final approval and 13 NIMZs have been accorded in-principle approval. Besides these, eight Investment Regions along the Delhi Mumbai Industrial Corridor (DMIC) project have also been declared as NIMZs.

SPECIAL ECONOMIC ZONES (SEZs) IN INDIA

SEZ is a specially delineated duty-free enclave treated as a deemed foreign territory within a country for the purpose of trade operations, duties and tariffs with special rules for facilitating foreign direct investment leading to exports.

India was one of the first in Asia to recognize the effectiveness of the Export Processing Zone (EPZ) model in promoting exports, with **Asia's first EPZ being set up in Kandla in 1965.** With a view to overcome the shortcomings experienced on account of the multiplicity of controls and clearances, absence of world-class infrastructure and to attract larger foreign investments in India, the **Special Economic Zones (SEZs) Policy** was **announced in April, 2000**.

This policy intends to make SEZs an engine for **economic growth** supported by quality infrastructure complemented by an attractive **fiscal package**, **both at the Centre and the State level,** with the minimum possible regulations.

SEZs in India functioned from November 01, 2000 to February 09, 2006 under the provisions of the **Foreign Trade Policy** and fiscal incentives were made effective through the provisions of relevant statutes.

To instil confidence in investors and signal the Government's commitment to a stable SEZ policy regime and with a view to impart stability to the SEZ regime thereby generating greater economic activity and employment through the establishment of SEZs, a comprehensive draft SEZ Bill was prepared after extensive discussions with the stakeholders.

The **Special Economic Zones Act, 2005**, was **passed by Parliament** in May, 2005. The SEZ Rules, came into effect on February 10, 2006, providing for drastic simplification of procedures and for single window clearance on matters relating to Central as well as State governments.

The **main objectives of the SEZ Act** are:

- Generation of additional economic activity.
- Promotion of exports of goods and services.
- Promotion of investment from domestic and foreign sources.
- Creation of employment opportunities.
- Development of infrastructure facilities.

The **SEZ Act, 2005** envisages a **key role for the State Governments** in Export Promotion and creation of related infrastructure. A **Single Window SEZ approval mechanism** has been provided through a 19-member inter-ministerial SEZ Board of Approval (BoA). The applications duly recommended by the respective State Governments/UT Administration are considered by the BoA periodically. **All decisions** of the **Board of Approval** are with **consensus**.

The **SEZ Rules** provide for **different minimum land requirements for different classes of SEZs**. Every SEZ is divided into a processing area where only the SEZ units would come up and the non-processing area where the supporting infrastructure is to be created.

Facts and Figures

- As on November 30, 2021, approvals have been accorded to 425 proposals for setting up of SEZs in the country.
- So far, 376 SEZs are notified, out of which 268 are operational.
- As on December 08, 2021, eight Special Economic Zones (SEZs) have been approved for the Agro and Food Processing sector in India. Out of these 8 SEZs, 7 have been notified and 3 SEZs are operational.
- As on September 30, 2021, total employment generation was about 25.60 lakh persons and investment of ` 6,28,565.89 crore has been made.

Salient Feature of SEZ Scheme

A designated duty-free enclave to be treated as a territory outside the customs territory of India for the purpose of authorised operations in the SEZ.

- No licence required for import.
- Manufacturing or service activities allowed.
- The Unit shall achieve Positive Net Foreign Exchange to be calculated cumulatively for a period of five years from the commencement of production.
- Domestic sales are subject to full customs duty and import policy in force.
- SEZ units will have freedom for subcontracting.
- No routine examination by customs authorities of export/import cargo.
- SEZ Developers /Co-Developers and Units enjoy Direct Tax and Indirect Tax benefits as prescribed in the SEZs Act, 2005.

In **2018**, the Government of India established a committee, chaired by **Baba Kalyani**, to devise the SEZ Policy for the country. The crucial recommendations put forth by the SEZ Policy Review Committee include:

- Shifting the focus from export growth to fostering widespread employment and economic growth.
- Developing distinct rules and procedures for manufacturing and service-oriented Special Economic Zones (SEZs).
- Transitioning from a supply-driven to a demand-driven approach to enhance investment efficiency based on specific industries and the existing inventory levels in the region.
- Establishing a framework to facilitate ease of doing business.
- Boosting competitiveness by promoting ecosystem development through funding for high-speed multi-modal connectivity, business services, and utility infrastructure.

Challenges

The SEZ experience in India has been deemed unsatisfactory so far, as highlighted by the Comptroller and Auditor General (CAG) report on SEZs. The report emphasises the urgent need for the government to reassess the impediments affecting the growth of non-operational and under-performing zones, given the significant shortcomings in achieving intended socio-economic objectives across SEZ sectors. The challenges faced by SEZs include:

- Underutilised land within SEZs.
- Limited flexibility in utilising SEZ land for diverse sectors.
- Existence of multiple economic zone models, such as SEZ, Coastal Economic Zone, Delhi-Mumbai Industrial Corridor, National Investment and Manufacturing Zone, Food Parks, and Textile Parks.

Additionally, challenges arise from domestic sales in SEZs, where entities face a disadvantage due to full customs duty obligations, contrasting with lower rates in ASEAN countries under Free Trade Agreements. Domestic firms engaging with SEZ units must make foreign exchange payments for services, although this norm does not apply to goods sales, where transactions can occur in rupee terms. The government's inconsistent policies regarding various tax exemptions for SEZs further contribute to the challenges.

In a significant development, the government, in the **2022-23 budget,** announced the replacement of the Special Economic Zones Act with new legislation. This legislation aims to empower states to participate in the **development of 'Enterprise and Service Hubs (DESH).'**

EASE OF DOING BUSINESS REPORT

The Ease of Doing Business (EoDB) index is a ranking system established by the **World Bank Group**. In the EODB index, 'higher rankings' (a lower numerical value) indicate better, usually simpler, regulations for businesses and stronger protections of property rights.

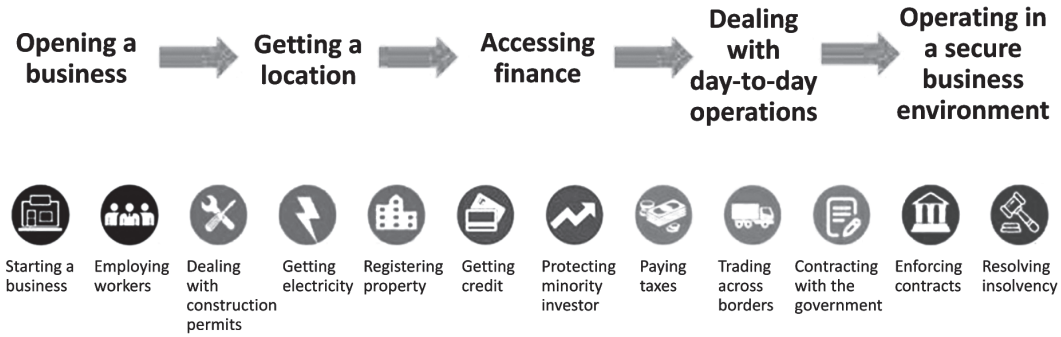


Fig. 15.2

The research presents data for 190 economies and aggregates information from 10 areas of business regulation depicted in above fig.

Rankings and weights on each of the mentioned parameters are used to develop an overall EoDB ranking. A high EoDB ranking means the regulatory environment is more conducive for starting and operating businesses.

India's Ease of Doing Business: Progress and Challenges

India has made significant strides in improving its ease of doing business (EODB) ranking in recent years. Here's a breakdown of their performance:

Positive Highlights

- **Jump in rankings:** India jumped 79 positions in the World Bank's Doing Business Report 2020, from 142nd to 63rd, making it one of the top 10 improvers globally.
- **Key reforms:** Streamlined regulations, reduced compliance burden, and improved access to finance contributed to the climb.
- **Specific improvements:** Notable progress was made in areas like construction permits, starting a business, resolving insolvency, and obtaining credit.
- **Investor confidence:** Improved ranking has boosted investor confidence and attracted foreign direct investment (FDI).

Challenges and Concerns

- **Distance to frontier:** Despite the rise, India still lags behind developed economies in EODB rankings.
- **Implementation disparities:** Effective implementation across states and sectors remains a challenge, with varying levels of progress.
- **Informal sector:** A large informal sector remains outside the reach of reforms, hindering inclusive growth.
- **Land acquisition and labor laws:** Persisting challenges in land acquisition and complex labor laws pose hurdles for certain industries.
- **Sustainability of reforms:** Sustaining the reform momentum and addressing emerging challenges are crucial for continued progress.

World Bank Discontinues The Rankings

The **World Bank has introduced a new methodology** and enhanced safeguards named **"Business Ready"** to evaluate the business environment in as many as 180 countries. This initiative follows revelations of data irregularities and perceived bias towards China, leading to the cancellation of the renowned **"Ease of Doing Business"** rankings two years ago.

Future Outlook

- India aims to be in the top 50 in the EODB rankings by 2025, requiring continued reform efforts.
- Focus on areas like taxation, trade logistics, and contract enforcement is expected.
- Simplifying land acquisition and addressing labor concerns are essential for sustained improvement.
- Promoting digital adoption and e-governance could further streamline processes.

MAKE IN INDIA

Background

The Make in India initiative was launched by the Prime **Minister in September 2014** as part of a wider set of nation-building initiatives. Devised to **transform India into a global design and manufacturing hub**, Make in India was a timely response to a critical situation.

"Make in India" is the flagship initiative of the Government of India with the aim of:

- Encouraging investments,
- Promoting innovation,
- Boosting skill development,
- Establishing top-notch manufacturing infrastructure,
- Safeguarding intellectual property,
- Digitalizing India,
- Cultivating positive diplomatic ties with various nations,
- Generating employment opportunities.

The program has **three primary objectives:**

1. Elevating the growth rate of the manufacturing sector to 12-14% annually.

2. Creating an additional 100 million manufacturing jobs in the economy by 2022.
3. Increasing the manufacturing sector's contribution to GDP to 25% by 2022 (later revised to 2025).

Strategy

The strategy is built on **four foundations** to foster entrepreneurship in India:

- **Innovative Processes:** Recognizing the significance of ease of doing business as the primary factor to encourage entrepreneurship.
- **Enhanced Infrastructure:** The government aims to establish industrial corridors and smart cities, develop world-class infrastructure incorporating cutting-edge technology and high-speed communication.
- **Diversified Sectors:** The initiative has pinpointed 25 sectors encompassing manufacturing, infrastructure, and service activities. Detailed information is disseminated through interactive web portals and professionally crafted brochures.
- **Revised Mindset:** To play a facilitating role rather than acting as a regulator, the government aims to collaborate with industries in driving economic development.

Positives

- **Increased FDI:** Foreign direct investment has risen significantly since the initiative's launch, contributing to increased production and job creation.
- **Focus on key sectors:** The program has prioritized crucial sectors like automobiles, electronics, pharmaceuticals, and textiles, leading to notable growth in these areas.
- **Improved business environment:** Efforts to streamline regulations, enhance infrastructure, and simplify procedures have eased doing business in India.
- **Brand recognition:** The "Make in India" brand has gained international recognition, attracting global companies and showcasing India's manufacturing potential.
- **Skill development:** Initiatives like Skill India program aim to bridge the skill gap and equip the workforce with relevant skills for manufacturing jobs.
- The government has established an **Investor Facilitation Cell** and special teams like Japan Plus and Korea Plus to assist and fast track foreign investment proposals.
- The government has initiated the development of six industrial corridors and industrial cities across the country.

Challenges

- **Implementation complexities:** Delays in land acquisition, bureaucratic hurdles, and inconsistent infrastructure development across states pose challenges for project execution.
- **Logistics and infrastructure:** India needs to upgrade its logistics infrastructure, including ports and connectivity, to fully meet its manufacturing aspirations.
- **High dependence on imports:** Over-reliance on imported raw materials and components can increase costs and hinder competitiveness.
- **Skill gap:** Despite ongoing efforts, bridging the skill gap in specific sectors remains crucial for attracting major manufacturing investments.
- **Competition from other countries:** Southeast Asian countries with established manufacturing ecosystems offer strong competition for attracting global companies.

Key Initiatives Undertaken

- The India Aspiration Fund, which provides venture capital financing for new and existing MSMEs.
- The SMILE scheme, which offers quasi-equity and term loans to SMEs in the Make in India sectors.
- The MUDRA bank, which provides development and refinance support to lenders of micro units and also helps with financial literacy and skill development.

Make in India 2.0 and the PLI Schemes

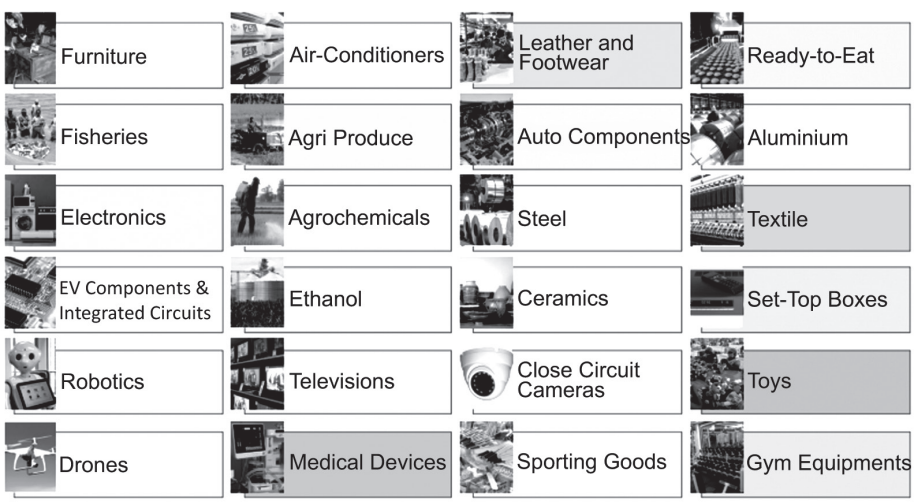


Fig. 15.3: 24 Sub-Sectors Under Make in India 2.0

To further enhance India's integration in the global value chain, 'Make in India 2.0' is now focusing on 27 sectors, which include 15 manufacturing sectors and 12 service sectors. Amongst these, 24 sub-sectors have been chosen while keeping in mind the Indian industries' strengths and competitive edge, the need for import substitution, the potential for export and increased employability. Efforts are on to boost the growth of the sub-sectors in a holistic and coordinated manner.

In pursuit of the objectives of the Make-in-India programme and with a vision to achieve Aatmanirbharta, the government launched the PLI scheme. The scheme is expected to attract a capex of approximately ₹ 3 lakh crore over the next five years.

Additional Measures to Strengthen The Make in India Initiative

To bolster the Make in India initiative, a series of reformative steps have been implemented, encompassing amendments to laws, the liberalisation of guidelines, and regulatory adjustments aimed at alleviating unnecessary compliance burdens. These efforts are directed at reducing costs and enhancing the overall ease of doing business in India. Burdensome compliances with rules and regulations have undergone streamlining, rationalisation, decriminalisation, and digitization, simplifying the business environment in the country.

Ease of Doing Business

- Reduced compliance burdens and simplified regulations.
- Streamlined procedures through amendments, liberalisation, and digitization.
- Lowered costs and improved business environment.

Labour Reforms

- Increased flexibility in hiring and retrenchment processes.

Manufacturing Promotion

- Reduced corporate taxes and implemented Phased Manufacturing Programme.
- Public procurement orders to prioritise local manufacturing.
- Quality control orders ensure high standards.

Production Linked Incentives (PLI)

- Launched across 14 key sectors (e.g., semiconductors, displays).
- Offers significant financial incentives to attract investments.

One-District-One-Product (ODOP)

- Promotes unique local products from each district.
- Provides a global platform for artisans and manufacturers.
- Contributes to regional socio-economic growth.

Gatishakti Programme

- Develops infrastructure for logistical efficiency.
- Improves connectivity and reduces costs for businesses.

State Initiatives

- Complementing the Make in India initiative, individual states have launched their own localised efforts, such as "Make in Odisha," "Tamil Nadu Global Investors Meet," "Vibrant Gujarat," "Happening Haryana," and "Magnetic Maharashtra."

Outcome

- **Foreign Direct Investment (FDI) Inflows:** The Indian government has implemented a transparent and permissive policy to encourage foreign investments, allowing most sectors to receive FDI through the automatic route.
- In 2014-2015, FDI inflows into India were USD 45.15 billion, and since then, there has been a continuous and record-breaking increase in FDI inflows for eight consecutive years.
- The **fiscal year 2021-22** marked the highest-ever FDI, reaching USD 83.6 billion.
- With ongoing economic reforms and improvements in the Ease of Doing Business, India is poised to attract USD 100 billion in FDI in the current financial year (2022-23).

Challenges

- Limited or absent market expansion for accommodating new players.
- Issues related to low labour cost and labour discipline in India.
- An analysis of employment creation data in Make in India sectors suggests that the thrust sectors may not necessarily be the most employment elastic ones.

INDUSTRIAL SECTORS - SHIPBUILDING SECTOR

The Shipbuilding industry is a strategically important industry due to its role in energy security, national defence and the development of the heavy engineering industry.

Significance of Ship Building Sector

- The shipbuilding industry can boost the GDP by increasing the output of the industry and services sector.
- The shipbuilding industry has **strong linkages with ancillary industries**, including steel, engineering equipment, and port infrastructure, creating a collaborative production ecosystem.
  - This linkage offers opportunities for smaller businesses, with around 65% of ship construction value coming from manufacturers of shipboard materials, equipment, and systems.
- The shipbuilding industry can support the goal of an 'Atma Nirbhar Bharat' (self-reliant India).

- The Indian Navy shipbuilding projects are providing momentum to the industry and aiming for strategic independence and niche technology.
- More than 130 Indian Navy warships have been built in India and 41 of 43 ships and submarines are being built in Indian shipyards.
- These initiatives are creating economic growth and employment opportunities.

Market Size of Indian Shipbuilding Sector

- Estimated to be USD 7.11 billion in 2023, projected to reach USD 8.76 billion by 2028 (CAGR of 4.57%).
- Contributes around 1.2% to India's Gross Domestic Product (GDP).
- Comprises over 150 shipyards employing around 80,000 people.

Types of Ships Built

- Focus on smaller vessels like barges, tugs, offshore supply vessels, and coastal cargo ships.
- Growing capabilities in building larger ships like defence vessels, tankers, and bulk carriers.

Challenges

- **Fierce global competition:** South Korea, China, and Japan dominate the market, posing significant competition for larger vessels.
- **Technological lag:** Access to advanced shipbuilding technologies and expertise lags behind major competitors.
- **Skill gap:** While existing workforce is skilled, specific specialised skills and workforce needs for larger vessels remain a concern.
- **Funding constraints:** Limited access to affordable financing compared to foreign shipyards hinders expansion and modernization.
- **Logistical bottlenecks:** Delays in port infrastructure and inefficient logistics raise operational costs and impact competitiveness.

Way Forward

The Indian shipbuilding sector has the potential to become a global leader, but overcoming these challenges is crucial. Government measures promoting technological advancements, skill development, and financial support are key. Additionally, building a strong ecosystem of suppliers and ancillary industries can strengthen the sector's competitiveness

INNOVATION AND STARTUP

Startups and the entire innovation ecosystem are the engines of growth for any country. India retains 40th rank out of 132 economies in the Global Innovation Index 2023 rankings published by the World Intellectual Property Organization.

- India has improved its GII rank from 81 in 2015 to 40 in 2023, thanks to its knowledge capital, start-up ecosystem, and research organisations.
- Innovation has helped India cope with the pandemic and pursue the goal of self-reliance (Atma Nirbhar Bharat).
- NITI Aayog has been facilitating policy-led innovation in various sectors and expanding the innovation ecosystem across the country.

The GII is a reliable tool for governments across the world to assess the innovation-led social and economic changes in their respective countries. Over the years, the GII has established itself as a policy tool for various governments and helped them to reflect upon the existing status quo.

START-UP INDIA

"I see startups, technology and innovation as exciting and effective instruments for India's transformation."

—Shri Narendra Modi Prime Minister of India

Startup India is a flagship initiative of the government of India, intended to catalyse startup culture and build a strong and inclusive ecosystem for innovation and entrepreneurship in India. **Launched on 16th January, 2016**, the Startup India Initiative has rolled out several programs with the objective of supporting entrepreneurs, building a robust startup ecosystem and transforming India into a country of job creators instead of job seekers. These programs are managed by a dedicated Startup India Team, which reports to the Department for Industrial Policy and Promotion (DPIIT). The **major objective of Startup India** is to discard some of the restrictive States Government policies which include:

- License Raj
- Land Permissions
- Foreign Investment Proposals
- Environmental Clearances

The **broad scope of Startup India's programs** is outlined in the Action Plan .

- **Simplification and Handholding:** Easier compliance, easier exit process for failed startups, legal support, fast tracking of patent applications and a website to reduce information asymmetry.
- **Funding Support and Incentives :**Exemptions on Income Tax and Capital Gains Tax for eligible startups; a fund of funds to infuse more capital into the startup ecosystem and a credit guarantee scheme.
- **Industry-Academia Partnership and Incubation:** Creation of numerous incubators and innovation labs, events, competitions and grants.

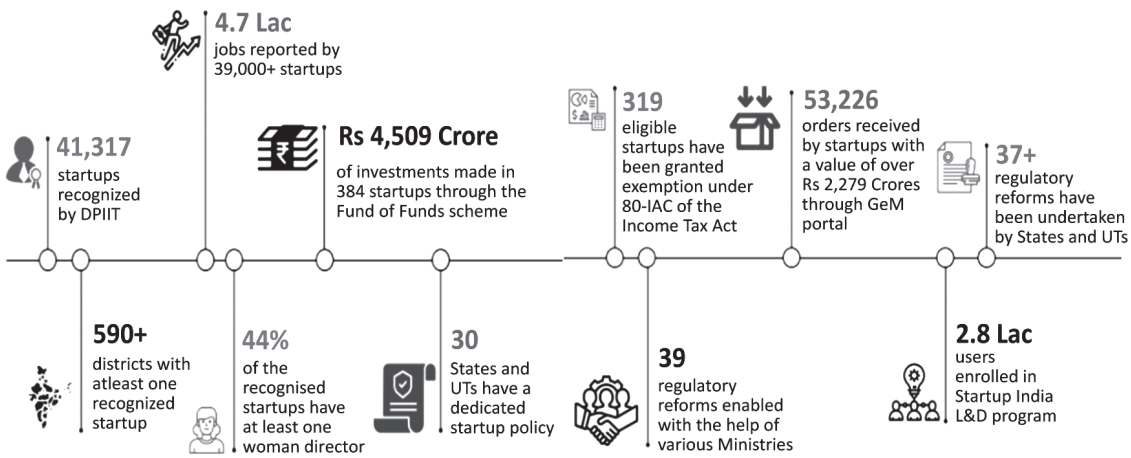

STARTUP INDIA
IN NUMBERS (JAN 2016-DEC 2020)
4.7 Lac
jobs reported by 39,000+ startups
41,317
startups recognized by DPIIT
Rs 4,509 Crore
of investments made in 384 startups through the Fund of Funds scheme
319
eligible startups have been granted exemption under 80-IAC of the Income Tax Act
53,226
orders received by startups with a value of over Rs 2,279 Crores through GeM portal
37+
regulatory reforms have been undertaken by States and UTs
590+
districts with atleast one recognized startup
44%
of the recognised startups have at least one woman director
30
States and UTs have a dedicated startup policy
39
regulatory reforms enabled with the help of various Ministries
2.8 Lac
users enrolled in Startup India L&D program

Fig. 15.4

Definition of Startup

The definition of a startup has been relaxed by DPIIT since the launch of the Action Plan, to enable more entities to apply for recognition. With the relaxations, there has been a jump in the application of entities to be recognized as startups:

As per the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry, a startup in India is defined as:

- An entity incorporated or registered in India under the Companies Act, 2013 or the Limited Liability Partnership Act, 2008.
- Not more than 10 years old from the date of incorporation or registration.
- Turnover not exceeding ₹ 100 crore in any of the preceding financial years.
- Working towards innovation or development of products or processes or services or a scalable business model with a high potential of employment generation or wealth creation.
- Not formed by splitting up or reconstruction of an existing business.

Government Initiatives to Foster a Startup Culture in the Nation

- As part of the "Make in India" campaign, the government intends to organise **an annual national-level Start-Up** fest to bring together all stakeholders in the startup ecosystem on a unified platform. Detailed information about the Make In India program can be found on the linked page.
- **Atal Innovation Mission (AIM):** AIM aims to encourage entrepreneurship through Self-Employment and Talent Utilisation **(SETU)**, providing support and mentorship for innovators to transform into successful entrepreneurs. It serves as a hub for generating innovative ideas.
- **Establishment of Incubators through Public-Private Partnerships (PPP):** To ensure the professional management of government-sponsored or funded incubators, the government will formulate a policy and framework for establishing incubators nationwide in collaboration with the private sector. The private sector will manage and operate the incubators. Learn more about Public-Private Partnership on the provided link.
- **Creation of 35 new incubators in existing institutions:** The Central Government will contribute 40% of the funding, the respective State Government will provide 40%, and the private sector will contribute 20% for the establishment of new incubators.
- **Development of 35 new private sector incubators:** The Central Government will offer a grant of 50%, up to a maximum of INR 10 crore, for incubators established by the private sector within existing institutions.
- Implementation of the **Startup India Seed Fund Scheme**, effective April 1, 2021. The scheme aims to offer financial assistance to startups for proof of concept, prototype development, product trials, market entry, and commercialization.
- **National Initiative for Developing and Harnessing Innovations (NIDHI)**
- **Startup India Action Plan (SIAP)**
- **SCO Startup Forum:** The first-ever Shanghai Cooperation Organisation (SCO) Startup Forum was launched in October 2020 to develop and improve startup ecosystems collectively.
- **Prarambh:** The 'Prarambh' Summit aims to provide a platform to startups and young minds from around the world to come up with new ideas, innovation and invention.

India's Space Startups Lag Behind

- Even as India's fintech and e-commerce startups thrive, the space startup domain stands as an exception.
- The worldwide space economy is presently assessed at $440 billion, and India's share in this market is below 2%.
- Despite India's standing as a prominent spacefaring nation with comprehensive expertise in satellite production, advanced launch vehicle creation, and interplanetary mission execution, this remains true.
- The absence of a structured framework offering transparency and legal clarity is a contributing factor to the limited involvement of independent private entities in the space sector.

As per the **"Slowdown in India's Startup Ecosystem"** report, there has been a significant drop in the addition of new startups to the esteemed unicorn list in 2023, signalling a deceleration in the Indian startup ecosystem. In 2023, only three startups achieved unicorn status, with valuations surpassing USD 1 billion, in contrast to the 24 additions in the preceding year, according to the ASK Private Wealth Hurun Indian Future Unicorn Index 2023.

Examining The State of The Startup Ecosystem in India

- **Exponential growth:** India is now the 3rd largest startup ecosystem globally, with over 68,000 registered startups and 105 unicorns (as of September 2023).
  - The **Indian Startup Ecosystem** has witnessed remarkable expansion in recent years (2015-2022):
    - A 15-fold increase in total startup funding.
    - A nine-fold rise in the number of investors.
    - A seven-fold increase in the number of incubators.
- **Diverse landscape:** Startups span various sectors like fintech, edtech, healthcare, SaaS, and e-commerce, catering to diverse needs and markets.
- **Robust funding:** Total funding reached over $140 billion, attracting prominent global and domestic investors.
- **Government support:** Initiatives like "Startup India" and "Digital India" provide resources, funding, and regulatory ease for startups.
- **Skilled workforce:** India's large pool of young talent and growing emphasis on skill development contribute to a readily available workforce.

Challenges Encountered by Indian Startups

- **Funding Challenges:**
  - Indian startups confront challenges in securing sufficient funding for their ventures, hindering their growth potential and innovative pursuits. Attracting investors and obtaining venture capital becomes challenging due to factors such as risk aversion, market uncertainties, and investor confidence issues.
- **Revenue Generation Struggles:**
  - Many startups grapple with generating sustainable revenues, struggling to identify viable business models, monetize products or services, and achieve profitability. Market limitations, competition from established players, and inadequate customer acquisition pose additional obstacles.
- **Lack of Supportive Infrastructure:**
  - The absence of a robust infrastructure ecosystem poses a hurdle to startup growth. Insufficient physical infrastructure, restricted access to technological resources, and a scarcity of incubation centres, mentorship programs, and networking opportunities hinder startups' access to essential resources, expertise, and guidance.
- **Regulatory Environment and Tax Structures:**
  - Indian startups face challenges related to regulatory hurdles and complex tax structures. Cumbersome compliance processes, bureaucratic red tape, and ambiguous regulations create impediments. Taxation complexities add to administrative burdens and may impact profitability.

The Path Ahead

- Continued investor confidence, government support, and talent development initiatives are expected to fuel further growth.
- Focus on deep tech, emerging technologies like AI and blockchain, and sustainable solutions holds immense potential.
- Expansion into smaller towns and rural areas can create new markets and opportunities.
- Building strong regional startup ecosystems with local support and resources is crucial for inclusive growth.

Overall, the Indian startup ecosystem is poised for further success, but addressing challenges and nurturing a supportive environment will be key to unlocking its full potential and revolutionising various sectors of the Indian economy.

STAND UP INDIA

The Hon'ble Prime Minister, Shri. Narendra Modi in his Independence Day address on August 15, 2015 unveiled his game changer campaign "Start-Up India" Stand-Up India **to promote entrepreneurship at grass root level for economic empowerment and job creation.**

The Stand-Up India Scheme launched to coincide with the celebration of the 125th birth anniversary of Dr. Babasaheb Bhimrao Ambedkar, seeks to leverage the **institutional credit structure to reach out to the underserved sector of people such as Scheduled Caste,Scheduled Tribe, and Women entrepreneurs** so as to enable them to participate in the economic growth of the nation. The scheme will benefit atleast 2.5 lakh borrowers through 1.25 lakh bank branch network located across the country.

Objectives

- Facilitate bank loans between ₹ 10 lakh and ₹ 1 crore to at least one SC/ST borrower and one woman borrower per bank branch for setting up greenfield enterprises.
- Encourage entrepreneurship and job creation across diverse sectors like manufacturing, services, agri-allied activities, and trading.
- Empower women and SC/ST communities by providing them with access to financial resources and business development support.

Key Features

- **Collateral-free loans:** The scheme provides loans without requiring physical collateral, making it easier for individuals with limited resources to access finance.
- **Interest rate subsidy:** The government offers a subsidy on the interest rate for the first three years of the loan, reducing the financial burden on borrowers.
- **Credit guarantee cover:** National Credit Guarantee Trustee Company (NCGTC) provides credit guarantee cover to participating banks, mitigating their risk and encouraging them to lend more readily.
- **Online application portal:** An online portal (standupmitra.in) simplifies the loan application process, making it more accessible and transparent.

Achievements

- Rs. 40,700 crore sanctioned to over 1,80,630 accounts under Stand-Up India Scheme (as of March 2023)
- More than 50% of the beneficiaries are women entrepreneurs.
- The scheme has contributed to job creation and economic empowerment in various sectors.

Challenges

- Low awareness of the scheme among potential beneficiaries, particularly in rural areas.
- Difficulties in accessing loans due to lack of proper documentation or credit history.
- Limited availability of training and support services for entrepreneurs after loan disbursement.
- Need for further streamlining of the loan application process.

Way Forward

- Continued efforts are needed to raise awareness and strengthen outreach to ensure the scheme reaches its full potential.
- Providing additional skill development and business support services can help entrepreneurs succeed and sustain their businesses.
- Encouraging banks to simplify loan procedures and improve their outreach to women and SC/ST communities is crucial.
- Monitoring and evaluating the scheme's impact and addressing emerging challenges will be essential for its long-term success.

The Stand-Up India Scheme holds significant promise for empowering women and SC/ST communities by fostering entrepreneurship and financial inclusion. Addressing the existing challenges and ensuring effective implementation will be key to maximising its impact and contributing to a more equitable and prosperous India.

ELECTRONICS SECTOR

India is actively positioning itself as one of the rapidly advancing economies globally, with a particular focus on electronic manufacturing. The international business community is increasingly eyeing India as the next hub for electronics manufacturing, driven by the growing domestic demand for electronic products.

Recognizing the sector's growth potential and its ability to generate significant employment, the Indian government is energetically pursuing the 'Make in India' program as a fundamental policy initiative to boost the country's manufacturing sector, including electronics.

Opening Opportunities For India

Electronics stands out as the largest globally traded and manufactured category, valued at over USD 2 trillion, with China supplying more than 50%. However, the escalating wage costs in China are prompting businesses to diversify their supply chains, presenting a unique opportunity for India.

India is positioned as a leading alternative for global electronics companies, with the potential for the electronics sector to become one of India's top exports in the next 3-5 years. The country aims to achieve a USD 1 trillion digital economy by FY26.

India's Production Landscape

The electronics manufacturing industry has witnessed substantial growth, increasing from USD 37.1 billion in 2015-16 to USD 67.3 billion in 2020-21. India's ambitious target is to reach USD 300 billion by 2026 through domestic production.

According to **MeitY's Vision Document 2.0**, achieving this target relies on shortlisting specific product segments with high scalability and addressing them through incentives and policy measures. To reach the USD 300 billion mark, exports of USD 120-140 billion are deemed critical for the electronics manufacturing sector.

Schemes For Electronics Manufacturing

To position India as a global hub for **Electronics System Design and Manufacturing (ESDM)**, several schemes have been introduced:

1. Production-Linked Incentive (PLI) Schemes for (a) Large Scale Electronics Manufacturing and (b) IT Hardware
2. Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)
3. Modified Electronics Manufacturing Clusters Scheme (EMC 2.0)

Additionally, India's Semiconductor Mission, backed by an incentive outlay of ~USD 10 billion, aims to foster a sustainable semiconductor and display ecosystem in the country.

India welcomes 100% Foreign Direct Investment (FDI) in electronics under the automatic route. For defence electronics, FDI up to 49% is permitted through the automatic route, with government approval required beyond this threshold.

Challenges in Establishing India as an Electronics Hub

- **Duties as a Double-Edged Sword:** Imposing high import duties and strict localization norms to encourage local manufacturing, while successful to some extent, negatively impact global competitiveness. This is particularly true in electronics, where supply chains are globally interconnected. Vietnam and China benefit from more favourable subsidy structures than India, especially in machinery and research and development.
- **Lack of Component Ecosystem:** India faces a challenge in lacking a robust ecosystem of companies locally manufacturing components for electronic products. Without a comprehensive component ecosystem, India resorts to importing components, leading to increased costs and longer lead times for manufacturers. The current lack of active policy support hinders the promotion of local manufacturing through domestic players.
- **Skill Development:** There is a shortage of skilled labour in the electronics manufacturing sector. To position itself as a global hub, India needs to invest in developing a highly skilled workforce proficient in electronics engineering, research and development, and advanced manufacturing technologies.
- **Regulatory Environment:** The regulatory framework and bureaucratic procedures in India are complex and time-consuming. Streamlining regulations and reducing bureaucratic red tape would improve the ease of doing business, attract investments, and create a conducive environment for electronics manufacturing.
- **Environmental Sustainability:** Electronics manufacturing generates electronic waste, posing environmental challenges. The absence of effective implementation of sustainable practices, such as e-waste management and promotion of environmentally friendly manufacturing processes, can have unintended negative consequences.

Steps to Improve India's Electronics Sector

- **Increasing Scalability:** Electronics manufacturing thrives in large clusters that provide economies of scale. India needs to envision manufacturing clusters at a larger scale. Currently, India has nearly 400 SEZs across the country, accounting for only half the exports compared to the Shenzhen SEZ in China. Creating mega, global-scale electronics clusters in strategic locations, such as UP (Noida), Tamil Nadu, and Telangana, is crucial.
- **Limiting High Exports Duty:** To secure a fair share of the global electronics market, a comprehensive overhaul is needed in thinking, especially regarding taxation, labor laws, and worker housing. India's shift from an import-substitution electronics economy to an export-led one requires simplifying the complex duty structure with high and constantly changing rates.
- **Private-Government Collaboration:** While India has excelled in manufacturing low-tech mobile phones, moving towards higher technology categories requires public-private collaboration, supportive policies, and a conducive legal framework. Initiatives such as creating a skilled IT workforce, rolling out semiconductor design-linked incentives, etc., contribute to building a robust electronic manufacturing ecosystem.
- **Cooperation amid Tensions:** Despite political tensions, India needs to find ways to do business with China for success in electronics manufacturing. The China-Taiwan example, where thousands of Taiwanese companies operate in China despite geopolitical tensions, serves as a potential model.
- **Increasing Flexibility:** Providing incentives for flexibility to Indian manufacturers is crucial for competitiveness. Similar to Vietnam's approach in 2008 that encouraged Samsung to move manufacturing, Indian manufacturers should be afforded flexibility to utilise the workforce effectively.

Emerging technologies are transforming the electronics industry, and India has the potential to become a global force by strengthening hardware manufacturing capabilities. Achieving the vision of a 'Self-Reliant India' requires various sectors to enhance capabilities, adopt technology, foster innovation, protect intellectual property, focus on skill development, and build supportive infrastructure.

STEEL

Steel acts as a crucial catalyst for industries, urban development, and infrastructure projects. As the **world's second-largest producer and consumer** (behind China), India boasts significant steel output. However, **per capita consumption lags behind the global average** (75.0 kg vs. 224 kg in 2021-22). Additionally, steel plant capacity utilisation remains low.

Challenges

- **Raw material dependence:** India significantly relies on imported coking coal, a key raw material, making it vulnerable to global price fluctuations.
- **Logistics bottlenecks:** Inefficient infrastructure and inadequate port facilities raise transportation costs and hamper smooth operations.
- **Environmental concerns:** The industry faces pressure to reduce its carbon footprint and adopt sustainable practices.

- **Competition:** Intense competition from global players and potential economic slowdowns can impact demand and profitability.
- **Skilled workforce gap:** Meeting the demand for skilled personnel in specific areas like automation and advanced manufacturing remains a challenge.

Recognizing steel's vital role in development, the government launched the **National Steel Policy 2017** (NSP-2017) to boost production capacity and global competitiveness. NSP-2017 aims for 300 million tonnes (MT) of crude steel capacity and 255 MT of finished steel by 2030-31, with a per capita consumption of 158 kgs.

Furthering this vision, the Atmanirbhar Abhiyan (Self-Reliant India Mission) of late 2020-21 took specific steps to enhance domestic production of value-added (VA) steel:

- **Production Linked Incentive (PLI) scheme:** Specialty steel products were included for PLI incentives.
- **Export parity pricing:** MSMEs (members of Engineering Export Promotion Council) receive steel at "export parity price" under the duty drawback scheme.
- **Government procurement preference:** Domestically produced iron and steel get priority in government purchases exceeding ₹ 25 crore.
- **Trade protection:** Anti-dumping and countervailing duties shield the domestic industry from unfair trade practices.

The Economic Survey 2022-23 reports robust steel sector performance in 2022-23 (April-December 2022). Both cumulative production and consumption of finished steel surpassed the figures of the previous four years at 88 MT and 86 MT, respectively.

The 11% growth in steel consumption reflects increased government capital expenditures (CAPEX). Steel production is anticipated to rise by 26 MT due to the PLI scheme, while exports remain 20% higher than pre-pandemic levels.

Way Forward

- Continued focus on modernization, technological advancements, and resource efficiency is crucial for sustainable growth.
- Developing efficient and resilient supply chains through domestic coking coal exploration and infrastructure improvements is essential.
- Prioritising environmental sustainability through cleaner technologies and energy-efficient practices is increasingly important.
- Expanding into niche markets and developing high-value steel products can enhance competitiveness and profitability.
- Investing in skill development and training programs to bridge the workforce gap is key for future needs.

Future prospects appear promising, driven by the government's focus on infrastructure projects, a resurgence in construction and real estate activities, and sustained demand from the automobile sector. However, global economic slowdown might lead to subdued export demand.

AUTOMOBILE

Zooming past Japan and Germany, India's automobile sector roared into 3rd place in global sales by December 2022. Already dominating two-wheeler and three-wheeler production, India also stands tall as the 4th largest passenger car maker. This powerhouse sector contributes a hefty 7.5% to India's GDP and 49% to manufacturing GDP, employing a whopping 37 million people by 2021.

But the journey doesn't end there. The automotive industry is poised to be a key player in the green revolution. Domestic electric vehicle (EV) sales are projected to rocket at a 49% annual rate, reaching 1 crore units by 2030. This green surge is expected to create 5 crore new jobs, propelling India's economic future. The government is greenlighting this growth with various initiatives.

However, the road ahead isn't entirely smooth. Rising borrowing costs, a potential dip in global demand, and the recent hike in third-party vehicle insurance premiums (particularly impacting two-wheelers) pose challenges that need to be addressed. The two-wheeler segment, in fact, saw its lowest sales in a decade due to the increased insurance costs.

Despite these hurdles, the Indian automotive sector is undoubtedly on a high-octane journey, fueled by ambition, innovation, and a commitment to a greener future. With careful navigation, India can keep this engine roaring and drive its economy to even greater heights.

ELECTRIC VEHICLES

The **Ministry of Heavy Industries** has launched **three schemes to promote electric and hybrid vehicles** production in the country. Their details are as under.

Total 15,04,012 Electric Vehicles Registered in last 2 Years in the months of June to December (PIB, 19 Dec 2023)

- The **Government notified Faster Adoption and Manufacturing of Electric Vehicles** in India **Phase II (FAME India Phase II) Scheme** with a **budgetary outlay of ₹ 10,000 crore** for a period of five years commencing from 1st April, 2019 to promote hybrid/ electric technology in transportation so as to reduce dependency on fossil fuels and to address issues of vehicular emissions. As far as e-Buses, electric three wheelers (e-3W) and electric four wheelers (e-4W) are concerned, the scheme provides subsidies to those vehicles which are used in public transportation or for commercial use. For electric two wheelers (e-

2W), privately owned vehicles are also provided with subsidies.

FAME II intends to support 7,090 e-Buses, 5 lakh e-3 Wheelers, 55,000 e-4 Wheeler Passenger Cars (including Strong Hybrid) and 10 lakh e-2 Wheelers. Production Linked Incentive (PLI) Scheme for **Automobile and Auto component industry with a budgetary outlay of ₹ 25,938 crore**, provides financial incentives to boost domestic manufacturing of Advanced Automotive Technology products including electric vehicles and their components. The scheme provides incentive up to 18% of eligible sales of electric vehicles and their components.

- **Production Linked Incentive (PLI) Scheme for Advanced Chemistry Cell (ACC):** The Government has approved PLI Scheme for manufacturing of ACC in the country with a budgetary outlay of ₹ 18,100 crore. The scheme incentivises the establishment of Giga scale ACC manufacturing facilities in the country for 50 GigaWatt hour (GWh). These ACCs will be used in batteries which are aimed to promote the widespread adoption of EVs.
- **Production Linked Incentive (PLI) Scheme for Automobile and Auto Component Industry** with a budgetary outlay of ₹ 25,938 crore provides financial incentives to boost domestic manufacturing of Advance Automotive Technologies (AAT) products (including electric vehicles and their components)

Further, Following Steps have Been Taken by The Government to Promote Adoption of Electric Vehicles in The Country

- The demand incentive for electric two wheelers has been increased to ₹ 15,000/KWh from ₹ 10,000/KWh along with an increase in cap from 20% to 40% of the cost of electric vehicle with effect from 11th June 2021, thus enabling cost of Electric two wheelers at par with that of Internal Combustion Engines (ICE) two-wheeler vehicles.
- **GST** on electric vehicles has been reduced from 12% to 5%; GST on chargers/ charging stations for electric vehicles has been reduced from 18% to 5%.
- The **Ministry of Road Transport and Highways (MoRTH)** announced that battery-operated Vehicles will be given green licence plates and be exempted from permit requirement for carrying passengers or goods.
- **MoRTH** issued a notification advising states to waive road tax on EVs, which in turn will help reduce the initial cost of EVs.
- **Vehicle scrappage policy** that provides incentives for the scraping of old vehicles and the purchase of new electric vehicles
- The **Ministry of Housing and Urban Affairs** has modified the Model Building Bye-laws, 2016 (MBBL) to require the allocation of 20% of parking space for electric vehicle (EV) charging facilities in both residential and commercial buildings.

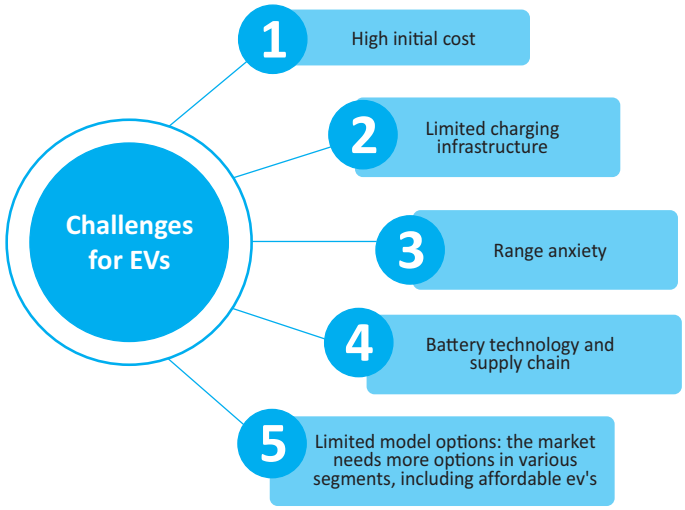


Fig. 15.5

India is part of a limited number of nations that endorse the worldwide EV30@30 initiative, seeking to achieve a minimum of 30% new vehicle sales as electric by the year 2030.

Way Forward For India to Adopt EV's

- **Reduce Initial Ownership Cost:** Provide subsidies, tax incentives, and financing schemes for both consumers and manufacturers to lower the initial cost of owning an EV.
- **Diversify EV Options:** Encourage innovation, competition, and collaboration among Original Equipment Manufacturers (OEMs), start-ups, and stakeholders to increase the variety of EV choices.
- **Promote Domestic Manufacturing:** Provide incentives and supportive policies to boost domestic manufacturing of EVs and related components.
- **Create Public Awareness:** Launch campaigns, portals, and platforms to educate the public about the benefits and incentives of EVs.
- **Improve Electricity Infrastructure:** Invest in renewable energy sources, smart grids, and energy storage systems to enhance electricity distribution and supply for EVs.
- **Reduce Charging Time:** Develop fast-charging and battery-swapping technologies and standards to decrease the charging time of EVs.
- **Expand Charging Infrastructure:** Establish a network of public and private charging stations nationwide with sufficient quality and accessibility.
- **Enhance Service Options:** Train and certify technicians, mechanics, and dealers for EV maintenance and servicing to improve service centre and repair options.
- **Government Adoption:** Encourage government institutions, including public transport authorities, to incorporate EVs into their fleets, creating demand and showcasing electric mobility viability.
- **Domestic Battery Manufacturing:** Develop a domestic battery manufacturing ecosystem, reducing reliance on

imports. The recent lithium discovery in Rajasthan could be instrumental in addressing this challenge.

India has established an ambitious objective of attaining net zero by 2070 during UNFCCC COP26. Electric vehicles (EVs) are pivotal in realising this goal. Despite EVs emitting zero tailpipe emissions, their overall environmental impact hinges on the origin of the electricity employed for charging. When sourced from renewables such as solar or wind, the environmental advantages of electric vehicles are optimised.

TEXTILES & APPARELS

The textile and apparel industry is more than just fabric; it's a vital thread in India's social and economic tapestry. It boasts a hefty 2% of GDP, a staggering 11% of manufacturing GVA, and direct and indirect employment for a colossal 10.5 crore people. This makes it the second-largest job creator in the country, second only to agriculture. Importantly, a significant portion of this workforce are women, making the industry a key player in women's empowerment and social development.

On the global stage, India is the sixth-largest exporter of textiles and apparel, renowned for its cotton yarn, fashion garments, and exquisite hand-made carpets. The industry's design prowess is globally admired, solidifying India's image as an industrial powerhouse. However, the sector faces internal and external economic challenges that threaten its momentum.

To Strengthen The Industry, The Government is Weaving A Supportive Framework with Several Key Schemes

- **ATUFS:** Reviving the technology of the textile industry through modernization and upgrades.
- **SITP:** Building world-class infrastructure in 56 sanctioned textile parks, with 23 already completed.
- **SAMARTH:** Skilling 10 lakh youth in the textile value chain, boosting industry employability.
- **MITRA:** Building 7 PM Mega Integrated Textiles Region and Apparel Parks to attract investments, reduce logistics costs, and generate jobs. Inspired by "farm to fibre; fibre to factory; factory to fashion; fashion to foreign," this ambitious scheme aims to create a complete ecosystem for the textile industry, propelling India onto the global textile map.

The future of the Indian textile and apparel industry is woven with challenges and opportunities. By strategically strengthening its internal fabric and embracing innovative government initiatives, this vital sector can continue to be a powerful driver of India's social and economic progress.

Technical Textiles: The Future of Textiles

Textile materials that are manufactured for their technical performances and functional properties rather than aesthetic and decorative features fall under the technical textiles category.

- These products are broadly classified into **12 different categories**- Agrotech, Oekotech, Buildtech, Meditech, Geotech, Clothtech, Mobiltech, Hometech, Sportstech,Indutech, Protech, Packtech.
- Technical textiles are engineered products with a definite functionality.
- They are manufactured using natural as well as man-made fibres such as Nomex, Kevlar, Spandex, Twaron that exhibit enhanced functional properties such as higher tenacity, excellent insulation, improved thermal resistance etc.
- These products find end-use application across multiple non-conventional textile industries such as healthcare, construction, automobile, aerospace, sports, defence, agriculture.

Technical Textile Sector in India

India's textile heritage is renowned, with its prowess in traditional fabrics and natural fibers recognized worldwide. But now, a new thread weaves into the story: technical textiles. Already the second-largest producer of polyester globally, India is rapidly becoming a key player in this fast-growing $19 billion industry.

- Technical textiles, with their unique properties and diverse applications, are transforming sectors like agriculture, construction, sports apparel, healthcare, and many more.
  - This surge aligns perfectly with India's modernization drive and manufacturing ambitions, making it a natural catalyst for growth.
- Despite contributing a significant 13% to the textile and apparel market and 0.7% to India's GDP, technical textiles remain underutilised.
  - The nation's consumption lags far behind advanced countries, hovering at just 5-10% compared to 30-70%.
  - Recognizing this immense potential, Prime Minister Narendra Modi and the CCEA have established the **National Technical Textiles Mission**.
    - This ambitious initiative aims to propel the domestic market to a staggering $40-50 billion by 2024, with an average growth rate of 15-20%.

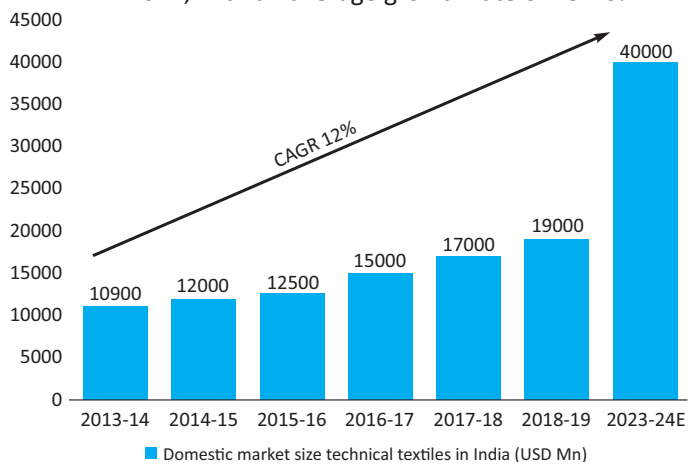


Fig. 15.6

India's journey from traditional textile giant to technical textiles powerhouse is well underway. By harnessing its potential, the nation can not only boost its economy and create jobs, but also contribute significantly to diverse industries, paving the way for a future woven with innovation and opportunity.

Government Initiatives to Boost Technical Textile Market

1. **Harmonized System of Nomenclature (HSN) Codes for Technical Textile:** In 2019, the Ministry of Textiles, Government of India dedicated 207 HSN codes to technical textiles to help in monitoring the data of import and export, in providing financial support and other incentives to manufacturers. The purpose of this classification is to increase international trade, and enable the market size to grow up to $ 26 Bn by the year 2020-21.
2. **100% FDI under Automatic Route:** The Government of India allows 100% FDI under automatic route. International technical textile manufacturers such as Ahlstrom, Johnson & Johnson, Du Pont Procter & Gamble, 3M, SKAPS, Kimberly Clark, Terram, Maccaferri, Strata Geosystems have already initiated operations in India.
3. **Technotex India:** It is a flagship event organised by the Ministry of Textiles, in collaboration with Federation of Indian Chambers of Commerce & Industry (FICCI) and comprises exhibitions, conferences and seminars with participation of stakeholders from across the global technical textile value chain.
4. **National Technical Textiles Mission:** With a view to position the country as a global leader in technical textiles, the CCEA has given its approval to set up a National Technical Textiles Mission with a total outlay of $ 194 Mn in February 2020.

   The Mission shall be set up for a four year implementation period from FY 2020-24 and will have the following four components:

   - Component - I (Research, Innovation and Development)
   - Component - II (Promotion and Market Development)
   - Component - III (Export Promotion)
   - Component - IV (Education, Training, Skill Development)

Schemes

1. **Scheme for Integrated Textile Park (SITP):** To boost entrepreneurship by providing financial support and state-of-the-art infrastructure, the scheme was launched in 2005 and has recently been extended for the period between 2017-20. The project cost will cover common infrastructure and buildings for production/ support activities (including textile machinery, textiles engineering, accessories, packaging), depending on the needs of the ITP. Each project will normally be completed in 3 years from the date of release of the first instalment of government grant.

   SITPs are dedicated to technical textiles, namely, Pallavada Technical Textiles Park (Tamil Nadu), Vraj Integrated Textile Park Ltd. (Gujarat), Mundra SEZ Integrated Textile and Apparel Park Pvt. Ltd (Gujarat), Gautam Buddha Textile Park Pvt. Ltd (Andhra Pradesh) and Great Indian Linen & Textile Infrastructure Co. (P) Ltd (Tamil Nadu) is functional in the country.
2. **Centres of Excellence:** The Ministry of Textiles had launched Technology Mission on Technical Textiles (TMTT) with two mini-missions for a period of five years from 2010-15 which entailed the creation of the following eight Centres of Excellence to provide infrastructure support, lead research and conduct tests of various technical textiles.

PHARMACEUTICALS INDUSTRY

The Indian pharmaceutical industry is a powerhouse, boasting impressive achievements and shaping the global landscape of medicines.

Strengths

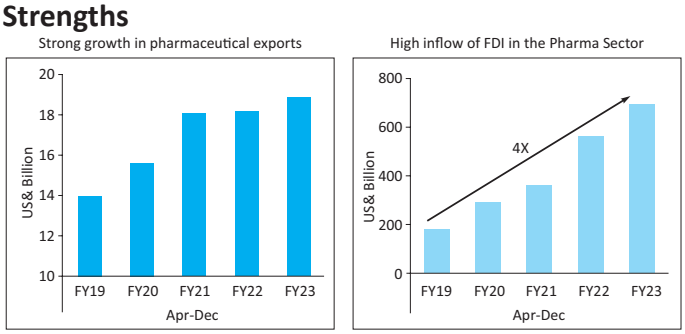


Fig. 15.7

- **Global leader:** India is the world's third-largest producer of pharmaceuticals by volume and the fourteenth -largest by value.
- **Affordability:** The industry excels at producing generic drugs at significantly lower prices, making them accessible to millions globally.
- **Vaccine hub:** India is the world's largest vaccine manufacturer, contributing significantly to global immunisation programs.
- **Strong talent pool:** Skilled scientists, engineers, and chemists form the backbone of the industry, contributing to high-quality production.
- **Government support:** Initiatives like "Make in India" and tax benefits encourage domestic production and attract foreign investments.

Challenges

- **R&D lag:** While excelling in generics, the industry faces challenges in developing innovative new drugs and high-end specialised pharmaceuticals.

- **Quality control concerns:** Maintaining consistent quality standards across diverse manufacturers requires ongoing inspection and improvement efforts.
- **Intellectual property challenges:** Balancing generic production with respecting intellectual property rights remains a delicate issue.
- **Price pressures:** Increasing competition and government price control measures can squeeze profit margins for some companies.
- **Environmental concerns:** Waste management and sustainable practices need further attention to ensure environmental responsibility.

Step by Government to promote Pharmaceuticals

The government has undertaken various measures to improve the infrastructural facilities of the pharma sector.

The concerned scheme, Strengthening the Pharmaceutical Industry (SPI), was launched on 11th March 2022 with a total financial outlay of ₹ 500 crore for five years from FY22 to FY26 with multiple objectives.

- First, it aims to strengthen the existing infrastructure facilities by providing financial assistance to pharma clusters to create common facilities.
- Second, it upgrades the production facilities of MSMEs to meet national and international regulatory standards by providing interest subvention or capital subsidy on their capital loans.
- Third, it also promotes knowledge and awareness about the pharmaceutical and medical devices industry by undertaking studies, building databases and bringing industry leaders, academia and policymakers together to share their knowledge and experience.

Three PLI Schemes to Boost Manufacturing Capacity in the Pharmaceutical Sector

Critical KSM Dis/APIs	Medical Devices	Pharmaceuticals
Tenure: FY21 to FY 30 Outlay: 6940 crore Progress: Until Dec 2022, 51 applicants approved with committed investment of ₹4,138.4 crore Employment: Estimated employment generation from 51 projects is 10,598 persons. Financial incentive: NA	Tenure: FY21 to FY28 Outlay: 3,420 crore Progress: Until Dec 2022, 21 applicants approved with committed investment of ₹ 1,058.97 crore. Employment: Estimated employment generation from 21 projects of around 6,411 persons. Financial incentive: The financial incentive at the rate of 5 per cent on incremental sales of medical devices for 5 years.	Tenure: FY21 to FY29 Outlay: 15,000 crore Progress: Until June 2022, 55 applicants approved with actual investment of ₹ 18,669 crone Employment: Estimated employment generation from 55 projects 20,000 direct and 80,000 indirect jobs. Financial Incentive: on incrementul sales under various categories at varying rate over the ycars ranging from 10 per cent to 3 per cent.

Way Forward

- **Embracing innovation:** Focusing on R&D, attracting and retaining talent, and collaborating with global peers are crucial for advancing into innovative drug development.
- **Enhancing quality standards:** Continuous improvement in manufacturing processes, quality control measures, and regulatory compliance is essential for sustained success.
- **Balancing affordability and innovation:** Striking a balance between producing affordable generics and investing in innovation will be key to long-term growth.
- **Exploring niche markets:** Focusing on specialised segments like biosimilars and complex generics can create further opportunities.
- **Adopting sustainable practices:** Implementing eco-friendly technologies and waste management solutions will ensure responsible growth and address environmental concerns.

Overall, the Indian pharmaceutical industry faces exciting opportunities and critical challenges. Embracing innovation, prioritising quality, and adapting to evolving market dynamics will be key to maintaining its global leadership and ensuring it continues to deliver on its promise of affordable and accessible healthcare for all.

COAL INDUSTRY

India aspires to be emission-free by 2070, a commendable goal in light of its current situation. However, the nation faces a significant challenge: its heavy dependence on fossil fuels. Currently, a staggering 55% of its energy requirements are met by coal, and it's not just power generation. Coal serves as an essential intermediary in numerous industries like iron and steel, cement, paper, and brick kilns.

The government, acknowledging this dependence, has adopted a cautious approach aimed at balancing energy needs with environmental responsibility.

Steps Towards Clean Coal

- **Greening the Landscape:** A significant initiative involves afforestation. By early 2023, over 143 million trees had been planted across 58,350 hectares, creating a carbon sink capable of absorbing 3.1 lakh tonnes of CO_2 equivalent annually. Plans to plant 50 million trees across 20,000 hectares by 2030 aim to further bolster this effort.
- **Harnessing Natural Alternatives:** Two Coal Bed Methane (CBM) projects are in the pipeline, offering a cleaner energy source with reduced carbon footprint.

- **Cleaner Coal Processing:** Surface coal gasification projects using 100 MT of coal per year are on the horizon, promising a relatively less carbon-intensive approach by 2030.
- **Improving Logistics:** Initiatives to enhance "first mile connectivity" are underway, aiming to optimise coal transportation from mines to dispatch points, improving efficiency and potentially reducing emissions.

Policy Initiatives

- **Modernising Regulations:** The Mineral Laws (Amendment) Act, 2020, introduced crucial changes to the Coal Mines (Special Provisions) Act, 2015, paving the way for a more flexible and efficient coal mining framework.
- **Boosting Private Participation:** By early 2022, 28 coal blocks were successfully auctioned to the private sector, with bids for another 88 mines underway. This marks a significant increase in private involvement compared to previous years, with the June 2020 auction seeing a 50% success rate compared to the historical 30%.

These initiatives demonstrate India's commitment to balancing its energy needs with its environmental goals. While the road to zero emissions by 2070 is a long and challenging one, these initial steps show a determination to navigate the complex realities of transitioning from a coal-reliant economy towards a cleaner future

Different measures have been initiated towards achieving self-reliance in coal production, including private participation in coal production,

- FDI under the automatic route,
- Auctioning of coal blocks for commercial production,
- Expansion of existing mines and opening of new mines,
- Greater use of mass production technology in mining,
- Mechanization of loading,
- Development of evacuation infrastructure etc.

The **coal industry is expected to grow at 6-7 per cent annually** to reach a production level of 1 billion tonnes by FY26 and about 1.5 billion tonnes by 2030. The enhanced domestic coal production is expected to meet domestic coal demand, replace substitutable imports, and escalate exports. There has also been a persistent effort to improve system capacity utilisation from about 80 per cent to above 90 percent.

GOVERNMENT INITIATIVES FOR INDUSTRIAL DEVELOPMENT

E-Biz Project

- E-Biz constitutes one of the integrated services projects and is **a component of the 27 Mission Mode Projects (MMPs)** falling under the **National E-Governance Plan (NEGP)** initiated by the Government of India. The **primary objective** of E-Biz is to **enhance the business environment** in the country by facilitating swift and efficient access to Government-to-Business (G2B) services through an online portal. This initiative aims to streamline and expedite various regulatory processes essential for initiating and managing businesses, thereby reducing unnecessary delays.
- The **project's overarching goal** is to establish an **investor-friendly business environment** in India by providing easily accessible regulatory information throughout the lifecycle of a business, from its inception to ongoing operations and potential closure. The ultimate vision is to create a transparent, efficient, and user-friendly interface for seamless interaction between the government and businesses, ensuring timely and cost-effective engagement.
- Developed through a **Public-Private Partnership (PPP) model** for a duration of 10 years, the eBiz portal was conceptualised with the support of the **National Institute of Smart Governance (NISG) and implemented by Infosys Technologies Limited (Infosys).**

National Manufacturing Policy, 2011

- **Rationale:**
  - The insufficient physical infrastructure, intricate regulatory framework, and a shortage of skilled manpower have hampered the growth of manufacturing in India. The **manufacturing sector's contribution to India's GDP** has remained stagnant at 15-16% since the 1980s, necessitating an increase to enhance efficiency, productivity, and accelerate overall development.
  - The **manufacturing sector** is poised to have a **multiplier effect** on job creation across various sectors.
  - Compared to other Asian countries where the manufacturing sector contributes around 25-34% to the GDP, India has not fully capitalized on globalization opportunities.
  - India benefits from a **favorable demographic dividend**, with 60% of the population aged 15-59. Therefore, creating meaningful employment opportunities for this demographic group with diverse skills is imperative.
  - Despite possessing abundant agricultural and natural resources, **India lags in value addition**. The growth of the manufacturing sector is seen as a solution to enhance value addition and decrease reliance on imported capital equipment.
  - Depth in manufacturing is crucial, particularly in strategic sectors like defense and telecommunications, to bolster competitiveness.
- **Features of the Policy:**
  - The **policy aims to boost the manufacturing sector's growth** to 12-14% over the medium term, making it the engine of economic growth. The target is for the manufacturing sector to contribute at least 25% to the national GDP by 2022.
  - **Aiming to create 100 million additional jobs by 2022,** the policy emphasises the development of suitable skill sets among rural migrants and the urban poor to ensure inclusive growth.

- It seeks to increase **domestic value addition and technological depth** in manufacturing.
- **Enhancing the global competitiveness** of Indian manufacturing through appropriate policy support is a key focus.
- Sustainability is emphasised, particularly concerning environmental aspects like energy efficiency, optimal utilisation of natural resources, and the restoration of damaged or degraded ecosystems.

❑ **Strategies for Implementation:**

- Encouraging foreign investments and technologies, leveraging the expanding market for manufactured goods in the country.
- Making competitiveness of enterprises the guiding principle in policy and program design and implementation.
- Reducing the compliance burden on industries by rationalising business regulations.
- The policy promotes the formation of clusters and aggregation, especially through the establishment of national investment and manufacturing zones (NIMZs).
- Modifications to align the National Manufacturing Policy (NMP) with initiatives like 'Make in India' and Industrial Revolution 4.0, involving high-end automation, have been announced by the government.

Initiatives for the Promotion and Development of MSMEs

Recognizing the significance of the MSME sector, the government has implemented several schemes and programs to support its growth. These include the **Prime Minister's Employment Generation Programme (PMEGP), Credit Guarantee Trust Fund for Micro and Small Enterprises (CGTMSE), Credit Linked Capital Subsidy Scheme (CLCSS) for Technology Upgradation, Scheme of Fund for Regeneration of Traditional Industries (SFURTI), and Micro and Small Enterprises Cluster Development Programme (MSECDP)** for establishing new enterprises and enhancing existing ones.

Additional initiatives undertaken for the promotion and development of MSMEs are outlined below:

❑ **Udyog Aadhar Memorandum (UAM):** Launched in 2015, the UAM scheme facilitates ease of doing business for MSMEs. Entrepreneurs can file an online memorandum to instantly obtain a unique Udyog Aadhaar Number (UAN).

❑ **Employment Exchange for Industries:** Introduced in June 2015 as part of Digital India, this exchange aims to connect job seekers with potential employers, fostering efficient matchmaking.

❑ **Framework for Revival and Rehabilitation of MSMEs:** This framework mandates banks to establish a Committee for Distressed MSME enterprises at zonal or district levels, formulating Corrective Action Plans (CAP) for these units.

Champion Sectors Identification in India

In 2020, the **Government of India (GOI)** pinpointed champion sectors within both manufacturing and services (a total of 27 sectors) to foster their growth and unlock their potential. These sectors have been earmarked for concentrated attention as part of the **Make in India** version 2.0 initiative. The Department of Industrial Policy and Promotion (DIPP), the principal department for 'Make in India,' leads the effort for Champion Sectors in Manufacturing, while the Department of Commerce oversees the initiative for Champion Sectors in Services.

The **Champion Sectors in Manufacturing,** comprising a total of 15 sectors, encompass:

1. Aerospace and Defence
2. Automotive and Auto Components
3. pharmaceutical and Medical Devices
4. Bio-Technology
5. Capital Geeds
6. Textiles and Apparels
7. Chemicals and Petrochemicals
8. Electronics System Design and Manufacturing (ESDM]
9. Leather and Footwear
10. Food Processing
11. Gems and Jewe lery
12. Shipping
13. Railways
14. Construction
15. New and Renewable Energy

The **Champion Sectors in Services,** totaling **12 sectors,** include:

1. Information Technology & Information Technology Enabled Services
2. Tourism and Hospitality Services
3. Medical Value Travel
4. Transport and Logistics Services
5. Accounting and Finance Services
6. Audio Visual Services
7. Legal Services
8. Communication Services
9. Construction and Related Engineering Services
10. Environmental Services
11. Financial Services
12. Education Services

A **dedicated fund of ₹5000 crore** has been proposed to support initiatives for the sectoral Action Plans of the Champion Sectors.

This initiative aims to increase India's services sector's share in global services exports from 3.3 percent in 2015 to 4.2 percent by 2022. Additionally, a goal has been set to achieve a share of services in Gross Value Added (GVA) of 60 percent (67 percent including construction services) by the year 2022, considering the share of services in GVA was about 5.3 percent for India in 2015-16.

Production Linked Incentive Schemes

Keeping in view India's vision of becoming **'Atmanirbhar', Production Linked Incentive (PLI)** Schemes for 14 key

sectors have been announced with an outlay of ₹ 1.97 lakh crore (over US$26 billion) to enhance India's Manufacturing capabilities and Exports. Scheme was launched in March 2020, the scheme **initially targeted three industries**:

- Mobile and allied Component Manufacturing
- Electrical Component Manufacturing and
- Medical Devices.

In the **PLI scheme, Domestic and Foreign companies** receive financial rewards for manufacturing in India, based on a percentage of their revenue over up to five years.

Currently it Includes 14 Sectors

- Mobile Manufacturing and Specified Electronic Components,
- Critical Key Starting Materials/Drug Intermediaries and Active Pharmaceutical Ingredients,
- Manufacturing of Medical Devices
- Automobiles and Auto Components,
- Pharmaceuticals Drugs,
- Specialty Steel,
- Telecom and Networking Products,
- Electronic/Technology Products,
- White Goods (ACs and LEDs),
- Food Products,
- Textile Products: MMF segment and technical textiles,
- High efficiency solar PV modules,
- Advanced Chemistry Cell (ACC) Battery, and
- Drones and Drone Components.

It aims to propel domestic manufacturing into the global arena by attracting cutting-edge technology and investments across 14 key sectors. They promise a game-changer for efficiency, scale, and competitiveness, leading to a potential surge in production, jobs, and economic growth within the next five years.

Bringing it to life: All Ministry-approved PLI schemes are actively underway, paving the way for a thriving ecosystem of domestic suppliers and vendors. MSME businesses are poised to play a major role, with 176 already securing PLI benefits in sectors like pharmaceuticals, drones, and textiles.

Strategic targeting: Each PLI sector was meticulously chosen with India's leapfrogging potential in mind. These carefully vetted areas promise multiplied employment, exports, and overall economic gains. Currently, no new sectors are being considered for inclusion.

In essence, PLI Schemes are:

- **Investment magnets:** Attracting cutting-edge tech and resources
- **Efficiency champions:** Boosting scale and competitiveness
- **Job creators:** Fueling production and employment growth
- **Ecosystem builders:** Empowering MSMEs and domestic suppliers

This strategic investment in India's manufacturing future holds immense promise for a stronger, more vibrant economy.

Incentives Under The Scheme

The incentives given, are calculated on the basis of **incremental sales.**

In some sectors such as advanced chemistry cell batteries, textile products and the drone industry, the incentive to be given will be calculated on the basis of sales, performance and local value addition done over the period of five years.

The emphasis on **R&D investment** will also help the industry keep up with global trends and remain competitive in the international market.

Challenges with The PLI Scheme

- **Assembly vs. Value Addition:**
  - The subsidy provided in the Mobile and Allied Component Manufacturing scheme is contingent on completing the phone in India rather than being linked to the amount of value added through manufacturing in the country. This results in a situation where very little beyond assembly occurs in India.
  - Consequently, a significant portion of the components for mobile phones continues to be imported. The imports of mobile phone components, including display screens, cameras, batteries, and printed circuit boards, witnessed a notable increase between FY21 and FY23. Interestingly, these two years align with the period of the most substantial growth in mobile phone exports.
- **WTO Constraints and Limited Value Addition:** World Trade Organization (WTO) regulations prevent India from tying PLI subsidies to domestic value addition. Although India's ambition to manufacture chips is commendable, the intricate nature of chips poses challenges. The limited domestic value addition can be attributed to these regulatory constraints.
- **Vague Disbursal of Incentives:** While an Empowered Committee has been established to oversee the PLI scheme and manage fund disbursement across various sectors, the process of awarding incentives lacks transparency.
  - The absence of well-defined criteria or standardised parameters for ministries and departments to determine incentive allocations raises concerns about the fairness and effectiveness of the scheme.
- **Lack of a Centralised Database:** The absence of a centralised database that comprehensively captures information such as increases in production, exports, and the number of new jobs created introduces administrative complexities into the evaluation process. This lack of information clarity not only affects transparency but also creates the potential for misconduct, exacerbating weaknesses in the policy framework.

PRODUCTION-LINKED INCENTIVE SCHEMES FOR SPECIFIC SECTORS

Production-Linked Incentive (PLI) Scheme For Speciality Steel

The Union Cabinet sanctioned the Production-Linked Incentive (PLI) scheme, a **Central Sector Scheme,** aimed at fostering the manufacturing of Speciality Steel (SS) with a **budgetary allocation of ₹ 6,322 crore** over a five-year span from 2023-24.

Understanding Speciality Steel

Speciality Steel represents value-added steel achieved by processing regular finished steel. This involves transforming normal finished steel into high-value steel through methods such as coating, plating, and heat treatment. **Besides applications** in the automobile sector and specialised capital goods, Speciality Steel finds utility in strategic areas like defence, space, and power.

Categories of Speciality Steel

Speciality Steel encompasses various types, including coated/plated steel products, high-strength/wear-resistant steel, speciality rails, alloy steel products, steel wires, and electrical steel.

PLI For Speciality Steel Objectives

The primary goal is to elevate India's Speciality Steel production from the current 18 million tonnes to 42 million tonnes by 2026-27.

Categories Under PLI For Speciality Steel

The PLI Scheme for Speciality Steel identifies **five categories**:

1. Coated/plated steel products.
2. High strength/wear-resistant steel.
3. Speciality rails.
4. Alloy steel products and steel wires.
5. Electrical steel.

Reasons For Choosing Speciality Steel

- **Increase Production:** The government's choice of Speciality Steel is driven by the fact that out of the total steel production of 102 million tonnes in 2020-21, only 18 million tonnes comprised value-added or speciality steel.
- **Reduce Imports:** With most imports falling into the value-added and speciality segment, the PLI scheme aims to enhance manufacturing capacities in this segment, reducing reliance on imports. In 2020-21, approximately 4 million tonnes of the 6.7 million tonnes of steel imports were speciality steel, causing a significant Forex outflow of around ₹ 30,000 crore.
- **Uptrend in the Sector:** The steel sector is experiencing growth, with major integrated producers planning substantial expansions.

Significance and Expected Outcomes

The PLI scheme for Speciality Steel is expected to:

- **Promote Local Manufacturing:** By ensuring finished steel is produced within India, the scheme encourages end-to-end manufacturing in the country.
- **Generate Employment:** Approximately 5 lakh people, including 68,000 directly employed individuals, are anticipated to benefit from increased job opportunities.
- **Attract Investments:** The scheme is expected to attract investments of about ₹ 40,000 crore and result in a capacity addition of 25 million tonnes for specialty steel.
- **Boost Exports:** The export of specialty steel is projected to increase from the current 1.7 million tonnes to about 5.5 million tonnes, earning a Forex of ₹ 33,000 crore.

This comprehensive scheme aims to position India as a global manufacturing hub for Speciality Steel, fostering economic growth, employment, and self-reliance in the steel sector.

Production Linked Incentive(PLI) Schemes For Textile

The PLI scheme for Textiles is a component of the broader set of PLI Schemes announced earlier as part of the **Union Budget 2021-22**, with an allocated budget of ₹ 1.97 lakh crore.

Features of The PLI For The Textile Sector

The scheme is designed to encourage the production of high-value **Man-Made Fiber (MMF)** fabrics, garments, and technical textiles. A total of ₹ 10,683 crore in incentives will be granted to the sector over a five-year period.

Eligibility and Incentives Structure

- **First Phase:** Any individual or company investing a minimum of ₹ 300 crore in plant, machinery, equipment, and civil works (excluding land and administrative building costs) for producing MMF fabrics, garments, and technical textiles is eligible to participate.
- **Second Phase:** Investors willing to invest a minimum of ₹ 100 crore under the same conditions as the first phase are eligible to apply.

Expected Benefits

- **Increase in Investment and Employment:** The scheme anticipates attracting fresh investments exceeding ₹ 19,000 crore, achieving a cumulative turnover of over ₹ 3 lakh crore, and generating additional employment opportunities for more than 7.5 lakh jobs in the textile sector, with additional support activities creating several more jobs.

PLI 2.0: A New Phase For Textiles Sector Incentive Scheme

- The government is currently in the process of seeking cabinet approval for the next installment of the PLI scheme tailored for the textiles sector, specifically targeting the apparels segment. This second edition of the scheme places a special emphasis on micro, small, and medium enterprises (MSMEs), with revised investment limits set at ₹ 50 crore and ₹ 25 crore under Part 1 and Part 2, respectively.

- Unlike the initial focus on Man-Made Fibers (MMF) in PLI 1, the upcoming PLI 2.0 aims to be fibre-neutral, encompassing both natural and synthetic fibers. While acknowledging the importance of concentrating on MMF in the earlier version, the government is keen on maintaining a foothold in the traditional market, predominantly centered around cotton.
- Financing for PLI 2.0 will be sourced from the unutilized funds from the first phase, amounting to nearly ₹ 4,000 crore. This strategic move aims to capitalize on the remaining funds to further stimulate investment and growth in the textiles sector.

- **Empowerment of Women:** Given the predominantly female workforce in the textile industry, the scheme is poised to empower women and enhance their participation in the formal economy.
- **Priority to Backward Areas:** Emphasizing investment in Aspirational Districts, Tier 3, Tier 4 towns, and rural areas, the scheme aims to incentivize industries to establish operations in backward areas. This prioritization is expected to have a positive impact on states such as Gujarat, Uttar Pradesh, Maharashtra, Tamil Nadu, Punjab, Andhra Pradesh, Telangana, Odisha, etc.

Production Linked Incentive Support on Jute Diversified Products (JDP)

The jute sector plays a **crucial role in the Indian economy**, particularly in Eastern India, by providing direct and indirect employment opportunities and generating export revenue. **India is the world's largest producer of jute, which is also known as golden fiber,** followed by Bangladesh, and exports make up approximately 15% of jute production.

However, the jute industry is grappling with shrinking acreage, excessive dependence on government orders, competition from Bangladesh, and a lack of modernization and diversification. Additionally, the industry has been influenced by government policies in key areas over the years.

Initiative

The **objectives of the Production Linked Incentive/Support component of the JDS Scheme are**:

- To make Jute Diversified Products cost competitive globally:
- To help JDPs manufacturers' exporters to fetch more business orders;
- To help develop markets and increase market share of JDPs globally;
- To attract more entrepreneurs in JDPs production, sales and exports;
- To help increase consumption of jute through increased businesses thereby supporting farmers to increase more jute cultivation;
- To help achieve 10% CAGR growth in sales of JDPs globally;
- To help increase export of JDPs to ₹ 1600 Cr. by 2026 against ₹ 963 Cr. presently, in combination with the support of other concurrent market and export promotion interventions.

Production Linked Incentive (PLI) Scheme For Semiconductor

Importance of Domestic Semiconductor Manufacturing

Semiconductors and displays serve as the cornerstone of the contemporary electronics industry, powering various devices from computers and smartphones to essential components in automobiles. Despite their critical role, **India relies heavily on imports** to meet its semiconductor needs, with the demand projected to surge to approximately USD 100 billion by 2025, up from the current USD 24 billion.

The imperative for **domestic manufacturing** stems from the need **to reduce import dependency,** particularly evident during disruptions in the global supply chain, such as those experienced during the COVID-19 lockdown. The geopolitical significance of securing trusted sources for semiconductors and displays is crucial for safeguarding critical information infrastructure.

In **response to these challenges,** the Union Cabinet approved modifications to the ₹ **76,000-crore semiconductor Production Linked Incentive (PLI) scheme in September 2022**.

Under the revised scheme, **all semiconductor fab plants will receive uniform fiscal support of 50 percent**, irrespective of node size—the smallest feature size reliably manufactured on a semiconductor wafer, often measured in nanometers. Earlier, incentives for semiconductor fabs were based on the size of the node; for example, higher-end nodes were given an incentive of 30 percent of the project cost.

This shift from size-based incentives is designed to further incentivize and bolster domestic semiconductor production.

Significance of The Plan

- The modified programme will expedite investments in semiconductor and display manufacturing in India.
- It aims for an entire integrated semiconductor ecosystem to be present in India.
  - Under the previous terms of the scheme, there was a potential risk that we would have established fabs in the country but the packaging would have happened elsewhere.
- **Self-Sufficient:** The government had announced a massive incentive plan to establish chip and display industries in India with the intent of becoming an electronics manufacturing hub and cut reliance on supplies from China.
- **Semiconductor market:** The technology nodes of 45nm and above have high demand which is driven by automotive, power, and telecom applications, which constitute around 50% of the total semiconductor market.

Future Outlook

The proposed incentives are structured to extend over a six-year period, with the aim of enticing investments totaling

1.77 trillion. Substantiating this commitment, a significant investment of $20 billion has already been secured from the Vedanta-Foxconn joint venture. This substantial funding is earmarked for the establishment of a semiconductor fab unit, a display unit, and various other projects located in Gujarat.

Production Linked Incentive Scheme (PLI) For Large Scale Electronics Manufacturing

The domestic electronics hardware manufacturing sector faces a lack of a level playing field vis-à-vis competing nations. The **sector suffers disability of around 8.5% to 11%** on account of:

- Lack of adequate infrastructure, domestic supply chain and logistics;
- High cost of finance;
- Inadequate availability of quality power;
- Limited design capabilities and focus on R&D by the industry;
- Inadequacies in skill development.

The **vision of the National Policy on Electronics 2019 (NPE 2019)** is to position India as a **global hub for Electronics System Design and Manufacturing (ESDM)** by encouraging and driving capabilities in the country for developing core components and creating an enabling environment for the industry to compete globally.

Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing notified on April 01, 2020, offers a production-linked incentive to boost domestic manufacturing and attract large investments in mobile phone manufacturing and specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units. The Scheme would tremendously boost the electronics manufacturing landscape and establish India at the global level in the electronics sector.

The scheme shall extend an **incentive of 4% to 6%** on incremental sales (over base year) of goods manufactured in India and covered under target segments, to eligible companies, for a period of five (5) years subsequent to the base year as defined.

The Scheme is open for applications for a period of 4 months initially, which may be extended. Support under the Scheme shall be provided for a period of five (5) years subsequent to the base year.

The Scheme will be implemented through a Nodal Agency, which shall act as a Project Management Agency (PMA) and be responsible for providing secretarial, managerial, and implementation support and carrying out other responsibilities as assigned by MeitY from time to time.

Second Round of The Production Linked Incentive Scheme (PLI) For Large-Scale Electronics Manufacturing

After the success of the First Round of the Production Linked Incentive Scheme in attracting investments in mobile phone and electronic component manufacturing, the proposal for accepting applications under the Second Round of the PLI Scheme has been approved by the Competent Authority. The target segment for the purpose of this round shall be Specified Electronic Components.

Under the Second Round, incentives of 5% to 3% shall be extended on incremental sales (over the base year, i.e., 2019-20) of goods manufactured in India and covered under the target segment to eligible companies for a period of four (4) years.

The Production Linked Incentive (PLI) Scheme For Automobile and Auto Components

The Union Cabinet approved the PLI-Auto Scheme on 15.09.2021 with **budgetary outlay of Rupee 25,938 crore** for a **period of 5 years** (FY 2022-23 to FY 2026-27). The **PLI-AUTO Scheme** will boost manufacturing of Advanced Automotive Technology (AAT) Products. This scheme will also help to facilitate and promote deep localization for AAT products and enable creation of domestic as well as global supply chains.

The Scheme is focused on **Zero Emission Vehicles (ZEVs)** i.e. Battery Electric Vehicle and Hydrogen Fuel Cell Vehicle. The incentive under the scheme is applicable from FY 2022-23 to FY 2026-27 (5 years' period) and the disbursement is applicable in the subsequent financial year i.e. from FY 2023-24 to FY 2027-28.

Objectives of The Advanced Automotive Technology Scheme

- **Boosting Domestic Manufacturing:**
  - Financial incentives: Attract production of advanced automotive technology within India.
  - Cost competitiveness: Bridge the gap between domestic and imported product costs.
  - Economies of scale: Increase production volume for efficient unit cost reduction.
- **Attracting Investment and Growth:**
  - Value chain development: Draw capital and expertise into the domestic automotive sector.
  - Robust supply chain: Build a reliable network for advanced technology components and materials.
  - Job creation: Generate new employment opportunities across the automotive industry.
- **Moving Up the Value Chain:**
  - **Higher value-added products:** Encourage production of more sophisticated automotive technology.
  - **Enhanced industry position:** Elevate India's standing in the global automotive market.
  - **Long-term sustainability:** Foster a thriving domestic ecosystem for advanced automotive technology.

Target Segments

The scheme is subdivided into **Champion OEM Incentive Scheme** and **Component Champion Incentive Scheme**. The Champion OEM Incentive scheme is a 'sales value linked' scheme, applicable on Battery Electric Vehicles and Hydrogen Fuel Cell Vehicles of all segments – 2 wheelers, 3 wheelers, passenger vehicles, commercial vehicles, Tractors, Automobile meant for Military use and any other

Advanced Automotive Technology vehicle as prescribed by MHI depending upon technical developments. The list of eligible Advanced Automotive Technology components will be prescribed by MHI. The list can be amended by MHI from time to time depending upon technological developments.

Importance of The New Production Linked Incentive (PLI) Scheme For Electric Vehicles (EVs)

- **Boosts EV production:** Works in tandem with existing schemes (FAME & ACC PLI) to significantly increase EV manufacturing.
- **Reduces carbon footprint:** Promotes cleaner transportation, leading to lower carbon emissions and oil dependence.
- **Advances technology:** Encourages use of cutting-edge technologies in auto component manufacturing.
- **Enhances localization:** Drives domestic production of auto components, reducing reliance on imports.
- **Attracts foreign investments:** Creates a lucrative environment for foreign companies to invest in Indian EV manufacturing.
- **Job creation:** Estimates project creation of 7.5 lakh new jobs in the automotive sector.

Government to Consider PLI Scheme For Chemicals and Petro-Chemical Sectors

- Finance Minister Nirmala Sitharaman announced the **government's consideration of the Production-Linked Incentive (PLI) scheme for the chemicals and petrochemicals sector**, aiming to make India a manufacturing hub in this segment.
- Emphasising the government's focus on green growth and energy independence by 2047, Sitharaman highlighted the industry's potential contribution to achieving net zero by 2070.
- Global manufacturers in the chemical industry are exploring India as an alternative manufacturing destination due to stringent pollution control regulations and increasing labour costs.
- The Finance Minister urged the industry to focus on sustainability, carbon emission reduction, and addressing pollution concerns while creating manufacturing capacity.
- The government's policies aim to facilitate viable options for domestic production with export potential.
- Sitharaman emphasised the importance of energy efficiency, renewable energy commitments, and the hydrogen mission in India.
- The government has approved a ₹ 19,744-crore incentive plan for the National Green Hydrogen Mission to promote green hydrogen production and cut emissions.
- Sitharaman encouraged Indian manufacturers to address challenges such as sustainability, recycling, skilling, and technology adoption, attracting global investors to the chemicals and petrochemicals industry.

PLI Schemes For Food Processing

The Production Linked Incentive Scheme for Food Processing Industry (PLISFPI) was approved by the Union Cabinet on 31st March 2021 with a **budget of ₹ 10,900 crores**, to be **implemented from 2021-22 to 2026-27**.

It consists of three components:

- Incentivizing manufacturing in four major food product segments,
- Promoting Innovative/Organic products of SMEs,
- Supporting branding and marketing abroad for Indian brands.

Additionally, the **PLI Scheme for Millet-based Products (PLISMBP)** was **launched in FY 2022-23 with an outlay of ₹800 crore**, utilising savings from **PLISFPI.**

The scheme boosts the capacity of the food processing industry by supporting food manufacturing entities that are willing to expand their processing capacity, incentivizing the growth of strong Indian brands, enhancing the presence of Indian food brands in the global market, creating more employment opportunities, and ensuring higher income for farmers.

The **Ministry is actively implementing three major scheme**s to promote the food processing sector:

- Pradhan Mantri Kisan SAMPADA Yojana (PMKSY),
- Pradhan Mantri Formalization of Micro Food Processing Enterprises (PMFME) scheme,
- Production Linked Incentive (PLI) Scheme.

These schemes offer comprehensive support across the entire food processing value chain, aiding the food industry in meeting international quality and safety standards for their food products.

Objectives of The PLISFPI

- Facilitate the emergence of global leaders in food manufacturing.
- Strengthen the presence of selected Indian food brands for international recognition and acceptance.
- Generate additional job opportunities beyond farming.
- Ensure profitable prices for agricultural produce, leading to increased income for farmers.

Features of PLISFPI

Coverage:

- Assistance for food manufacturing entities meeting minimum sales criteria and willing to make stipulated investments for expanding processing capacity and international branding.
- **Incentives for manufacturing four key food product segments:** Ready to Cook/ Ready to Eat (RTC/ RTE) foods, Processed Fruits and Vegetables, Marine Products, and Mozzarella Cheese.
- Inclusion of organic products, free-range eggs, poultry meat, and egg products.

Components:

- Incentivizing manufacturing of specific food segments.
- Support for branding and marketing efforts in international markets.

The **PLI Scheme for Food Processing Industry incentivises MSMEs** that focus on innovative products, boosting innovation in the food processing sector. Additionally, the PLI Scheme for Millet-based Products promotes millets, which are special grains that need less resources to grow, provide excellent nutrients, and can withstand changes in the weather, which helps in achieving the goal of sustainability.

To promote **"Brand India"** globally, the PLI Scheme for Food Processing Industry supports companies with branding and marketing abroad, boosting the emergence of strong Indian brands. Companies receive 50% financial incentives for expenditure on international branding, capped at 3% of food product sales or ₹ 50 Crore per year, whichever is less. Presently, 77 applications are covered under this PLI component.

MEGA FOOD PARK SCHEME

The Scheme of Mega Food Park aims at providing a **mechanism to link agricultural production to the market by bringing together farmers, processors and retailers** so as to ensure maximizing value addition, minimizing wastage, increasing farmers income and creating employment opportunities particularly in the rural sector.

The Mega Food Park Scheme is based on the **"Cluster" approach** and envisages creation of state of art support infrastructure in a well-defined agri / horticultural zone for setting up of modern food processing units in the industrial plots provided in the park with a well-established supply chain. Mega food parks typically consist of supply chain infrastructure including collection centers, primary processing centers, central processing centers, cold chains and around 25-30 fully developed plots for entrepreneurs to set up food processing units.

The Mega Food Park project is implemented by a Special Purpose Vehicle (SPV) which is a Body Corporate registered under the Companies Act. State Government, State Government entities and Cooperatives are not required to form a separate SPV for implementation of the Mega Food Park project.

The **scheme has been discontinued by the Government** with effect from **01.04.2021 with provision for committed liabilities for ongoing projects only**.

FOREIGN DIRECT INVESTMENT

Production incentives under Atma Nirbhar Bharat also incentivise foreign investments for domestic production. The last eight years have seen further liberalisation of the policy towards foreign investors, with most sectors now open for 100% Foreign Direct Investment (FDI) under the automatic route. This has resulted in a visible structural shift in the gross FDI flows to India during the last decade. India's gross FDI has increased from an average of 2.2 per cent of GDP during FY05-FY14 to 2.6 per cent in FY15-FY22. The highest-ever annual gross FDI inflow of USD 84.8 billion was recorded in FY22. These trends are an endorsement of India's status as a preferred investment destination amongst global investors.

Structural shift in the Gross FDI/GDP during 2014-15

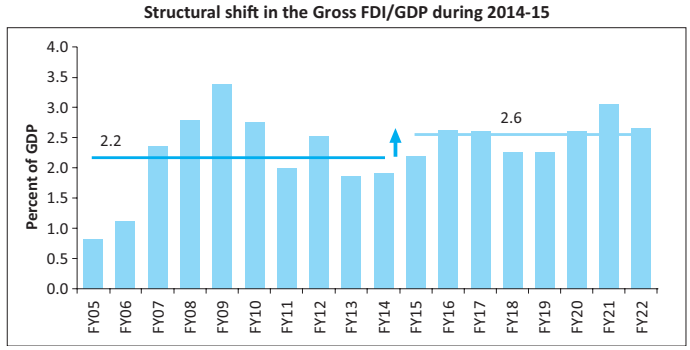


Fig. 15.8

India is one of the fastest-growing insurance markets in the world and is expected to emerge as one of the top six insurance markets by 2032. Digitisation of India's insurance market, accompanied by an increase in FDI limit for insurance companies, is likely to facilitate an increased flow of long-term capital, a global technology, processes, and international best practices, which will support the growth of India's insurance sector.

Resilient FDI Inflow in Manufacturing Sector

Annual FDI equity inflows in the manufacturing sector have been steadily increasing over the last few years. It jumped from US$ 12.1 billion in FY21 to US$ 21.3 billion in FY22 as the pandemic-driven expansionary policies of advanced economies led to a surge in global liquidity. With the rise in global uncertainty in the wake of the Russia-Ukraine conflict, FDI equity inflow in manufacturing in the first half of FY23 fell below its corresponding level in the first half of FY22. The monetary tightening at the global level has further restricted the FDI equity inflows. A rebound in FDI inflows is, however, expected as the Indian economy sustains its high growth while monetary tightening the world over eventually eases with the weakening of inflationary pressures.

Sector-wise FDI Equity Inflows in 2022-23 durng April-September 2022

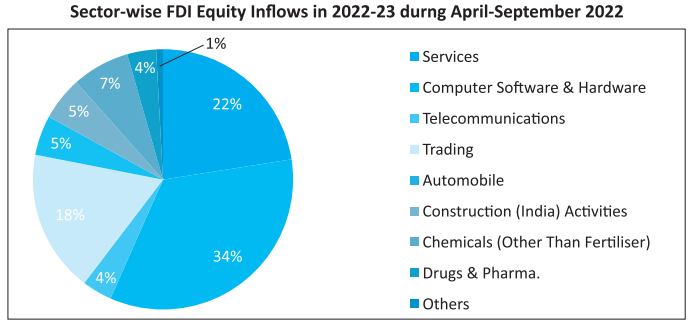


Fig. 15.9

Not with standing an overall drop in FDI in the first half of FY23, inflows have stayed above the pre-pandemic levels,

driven by structural reforms and measures improving the ease of doing business, making India one of the most attractive FDI destinations in the world. The government has implemented an investor-friendly FDI policy under which FDI up to 100 per cent is permitted through automatic route in most sectors. India continues to open up its sectors to global investors by raising FDI limits, removing regulatory barriers, developing infrastructure, and improving the business environment

FDI Policy Reforms to Bolster Investment

- In FY20, 100 per cent FDI under automatic route was permitted for the sale of coal, and coal mining activities, including associated processing infrastructure, subject to provisions of relevant acts. 26 per cent FDI under the government route has been permitted for uploading/ streaming of News and Current Affairs through Digital Media. 100 per cent FDI has been permitted in Intermediaries or Insurance Intermediaries, including insurance brokers, reinsurance brokers, insurance consultants, corporate agents, third-party administrators, Surveyors and Loss Assessors and such other entities as may be notified by the Insurance Regulatory and Development Authority from time to time
- To curb opportunistic takeovers/acquisitions of Indian companies due to the Covid-19 pandemic, the government amended the FDI policy, according to which an entity of a country which shares a land border with India or where the beneficial owner of investment into India is situated in or is a citizen of any such country, can invest only under the Government route.
  - Further, in the event of the transfer of ownership of any existing or future FDI in an entity in India, directly or indirectly, resulting in the beneficial ownership falling within the restriction/purview of the said policy amendment, such subsequent change in beneficial ownership will also require government approval.
- To simplify the approval process of foreign Investment and to promote ease of doing business, the erstwhile Foreign Investment Promotion Board (FIPB) was abolished in May 2017, and a new regime has been put in place. Under the new regime, the process for granting FDI approvals has been simplified, wherein the work relating to the processing of applications for FDI has been delegated to the concerned Ministries/ Departments, and DPIIT is the nodal department for facilitating the process.
- A revamped portal, **"Foreign Investment Facilitation Portal (FIF Portal)"**, has been launched as the online single-point interface of the Government of India for investors to facilitate Foreign Direct Investment. The portal facilitates single window clearance of applications which are through the government approval route. The FIF Portal has been integrated with the National Single Window System (NSWS).

INDUSTRY 4.0: INDIA'S ENGINE FOR ATMA NIRBHARTA

The dawn of the fourth industrial revolution, Industry 4.0, is upon us. This revolution promises to transform manufacturing through the integration of cutting-edge technologies like cloud computing, the Internet of Things (IoT), machine learning, and artificial intelligence (AI). While India's manufacturing sector is still in the early stages of adopting these technologies, the groundwork is being laid for a large-scale shift.

Building The Foundation

- **Internet Penetration:** A crucial prerequisite for Industry 4.0 is widespread internet access. India has made significant strides in recent years, with internet penetration reaching over 60% of the population. This expanding digital landscape provides fertile ground for the adoption of smart technologies.
- **Semiconductor Self-Reliance:** The brains behind Industry 4.0 are powerful semiconductors. India's push towards self-reliance in semiconductor technology with initiatives like the India Semiconductor Mission is another key pillar in its Industry 4.0 journey. This will ensure access to vital processing power for future manufacturing endeavours.

Government Initiatives

- **SAMARTH Udyog Bharat 4.0:** Recognizing the importance of Industry 4.0 for its Atma Nirbharta goals, the government has launched initiatives like SAMARTH Udyog Bharat 4.0. This program aims to equip Indian manufacturing units with technological solutions through awareness programs and demonstrations.
- **Centre for Fourth Industrial Revolution:** To guide policy development for emerging technologies, the government established the Centre for Fourth Industrial Revolution in India in 2018. This centre provides crucial support in navigating the complex policy landscape of Industry 4.0.

Challenges and Opportunities

India's journey towards Industry 4.0 is not without its challenges. Skills development, infrastructure upgrades, and access to affordable technology remain key hurdles. However, the government's proactive approach and the rapid advancements in technology offer promising opportunities. By embracing Industry 4.0, India can not only achieve its Aatmanirbharta goals but also become a global leader in the manufacturing landscape of the future.

CONCLUSION

Despite global challenges, India's industry grew in FY23, driven by strong domestic demand, credit growth, and MSME support through ECLGS. Manufacturing benefited from FDI, eased input costs, and capacity utilization, with PLI schemes promising further growth despite potential risks.

Services Sector

16

INTRODUCTION

The economy's service sector, sometimes referred to as the tertiary sector, encompasses a wide range of economic activities that provide intangible goods and services. Information technology, banking, insurance, healthcare, education, hospitality, and entertainment are a few examples of service sector activities.

The services sector's compound annual growth rate has consistently risen over the decades, from 6.2% during the 1980s to 7.3% during the 1990s and further to 8.7% during the 2001-16 period, exceeding overall GDP growth throughout.

It witnessed a swift rebound in FY22 driven by growth in the contact-intensive services sub-sector, which bore the maximum burden of the pandemic. This subsector completely recovered to the pre-pandemic level in Q2 of FY23, driven by the release of pent-up demand, ease of mobility restriction, and near-universal vaccination coverage.

Overall Performance

- India's service sector is the **second fastest-growing sector in the world after China**.
- The share of the service sector in total GVA is 53.89%.

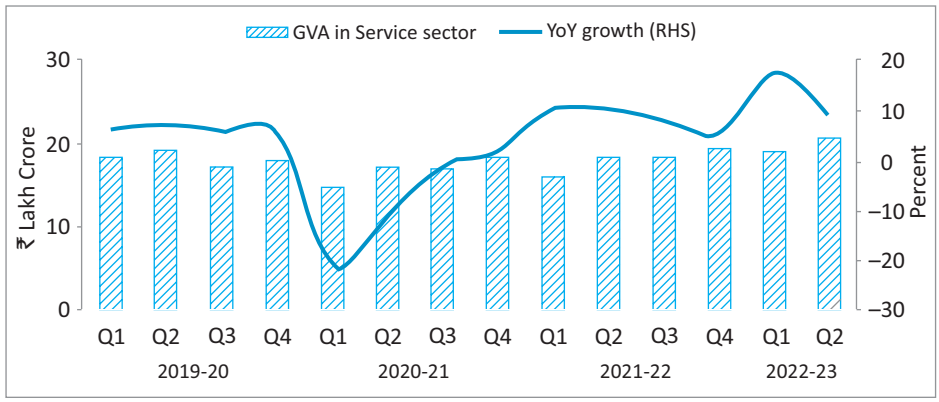


Fig. 16.1: Broad-based growth in the service sector (Economic Survey 2022-23)

- Approximately 33% of India's workforce is employed in the service sector.
- It is the largest receiver of FDI. The service sector accounts for about 60% of all FDI inflow.

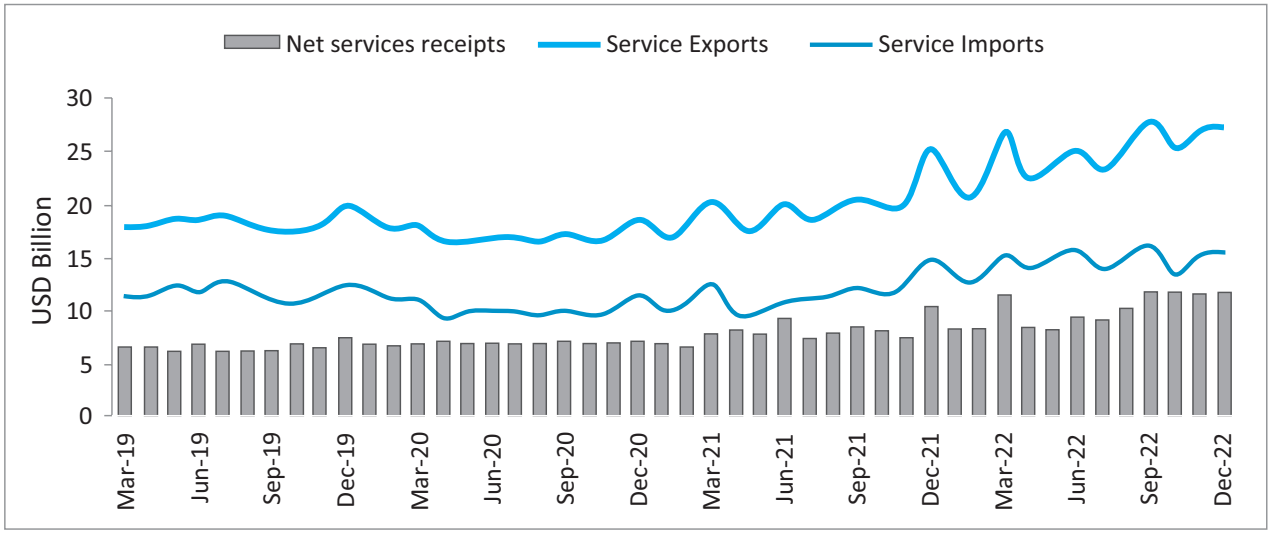


Fig. 16.2: Service exports (Economic Survey 2022-23)

- At the state and UT levels, Chandigarh has the highest services share in state GVA (Economic Survey 2021-22) followed by Delhi.
- India's share of global service exports is approximately 4.4%.
- Service Exports remained resilient amid geo-political uncertainties.

Foreign Direct Investment (FDI) in Services

- **The World Investment Report 2022 of UNCTAD** places India as the seventh largest recipient of FDI in the top 20 host countries in 2021.
- In FY22, India received the highest-ever FDI inflows of US$ 84.8 billion, including US$ 7.1 billion in FDI equity inflows in the services sector.
- To facilitate investment, various measures have been undertaken by the Government, such as the launch of the **National Single-Window system,** a one-stop solution for approvals and clearances needed by investors, entrepreneurs, and businesses.
- To ensure the liberalisation of investment in various industries, the Government has permitted 100 percent foreign participation in telecommunication services, including all services and infrastructure providers, through the Automatic Route. The FDI ceiling in insurance companies was also raised from 49 to 74 percent, under Automatic Route. Further, the Government has allowed 20 percent foreign investment in Life Insurance Corporation (LIC) under the automatic route.

India's Multilateral and Regional Engagements in Services

- India has been actively involved in the WTO services negotiations. It has taken a proactive position in the services negotiations on temporary cross-border movement of service providers (mode 4) and cross-border supply of services (mode 1) under the General Agreement on Trade in Services (GATS).
- In the Doha round, India offered to exchange commitments on foreign commercial presence in return for market access in mode 1 and 4.
- India is not a participant in the Trade in Services Agreement (TISA), an agreement among 23 like-minded countries, which account for more than 70% of global trade.
- In 2017, India reinvigorated the services discussions by submitting a draft text to WTO on Trade Facilitation in Services (TFS), which aimed at addressing behind-the-border administrative and procedural barriers to services trade.
- India has increasingly turned towards signing bilateral and regional trade agreements as multilateral negotiations on services slowed down. Examples include several comprehensive bilateral agreements with Japan and Malaysia in 2011, the expansion of the ASEAN-India FTA to include services and investment in 2015, etc.

SECTOR WISE PERFORMANCE

E-Commerce

The term pertains to the online purchase and sale of products and services. Electronic financial transfers, digital data exchanges, and online transactions are all involved. Currently, the Consumer Protection Act of 2019, the Information Technology Act of 2000, the Competition Act of 2002, and the FDI policy all regulate this industry.

General Data

- In terms of the global e-commerce market, India ranks eighth.
- With a 10-15% share of the Indian retail market, it is a sunrise sector.
- The Indian e-commerce market is expectedUS$ 111 billion by 2024 and US$ 200 billion by 2026.
- As the ecosystem matures, the mix of e-commerce is going to change. Fashion, grocery and general merchandise is going to capture nearly two-thirds of the Indian e-commerce market by 2027.

Growth Drivers

- The E-Commerce sector witnessed a renewed push and a sharp increase in penetration in the aftermath of the pandemic. Lockdowns and mobility restrictions disrupted consumer behaviour and gave an impetus to online shopping.
- The Government's push to boost the digital economy, growing internet penetration, rise in smartphone adoption, innovation in mobile technologies, and increased adoption of digital payments further accelerated the adoption and growth of e-commerce.
- The expansion of e-commerce to newer segments like grocery, fresh-to-home fruits and vegetables, and general merchandise has contributed to the expansion of the customer base beyond traditional buyers.
- Further, there has been a phenomenal geographical expansion with the growth of e-commerce business in rural India driven by increased smartphone penetration, internet adoption, and increased purchasing power of rural customers. A vast untapped rural market holds the potential for strengthening consumption growth; new E-commerce companies like Trell, Meesho, and Shop 101, are expanding and gaining popularity in Tier 3 and 4 cities.

Initiatives Taken By The Government For The Promotion of E-Commerce Sector

Initiatives taken by the Government for the promotion of e-commerce, including the Digital India program, Unified

Payment Interface (UPI), GeM, etc., have been major contributory factors to the growth of E-commerce in recent years. Various initiatives have also been taken to provide an opportunity to small retailers, manufacturers, and Self-Help Groups for greater outreach.

- **One District – One Product (ODOP)**
  - This is an initiative under the **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.**
  - It facilitates the onboarding of sellers of identified products on e-commerce platforms to provide greater visibility for small businesses from the rural sector.
- **Government e-Marketplace**
  - This initiative was launched in 2016 by the **Ministry of Commerce and Industry.** GeM 3.0 is the current version launched in 2018.
  - GeM helps government departments, organisations, and PSUs purchase common usage goods and services online.
  - Over 1.54 crore transactions have been made on GeM overall.
  - Research suggests that the platform has produced minimum savings of roughly 10%, which translates to savings of nearly ₹ 40,000 crore for the government.
- **www.tribesindia.com Portal**
  - Through this portal **Tribal Cooperative Marketing Development Federation of India Limited (TRIFED)** has been onboarding tribal artisans with their products for online sales, ensuring tribal products find a larger audience in the international market as well.
- **Open Network for Digital Commerce (ONDC)**
  - This recent initiative is also playing a significant role in democratising digital E commerce , enabling interoperability, and bringing down transaction costs. ONDC provides better market access to sellers and helps bring the country's remotest corners into the e-commerce framework by empowering them with digitization.
- **National e-commerce policy**
  - The government has put up a proposal for a national e-commerce policy that highlights the importance of streamlining regulations, improving technology, and effectively integrating supply chains.
- **Key Points About The Proposed E-Commerce Policy**
  - The e-commerce policy will act as a sector-wide framework, guaranteeing consistency across different regulatory acts.
  - The marketplace model allows for 100% foreign direct investment (FDI), however the inventory-based model forbids FDI. The idea of creating a regulator just for the e-commerce industry is being explored.
  - India's potential for e-commerce exports is predicted to be between 200 billion and 300 billion USD a year by 2030. The policy acknowledges India's e-commerce sector's substantial export potential and aims to promote the same.
  - For uniformity, the e-commerce policy and the Consumer Protection (e-commerce) Rules 2020 will be aligned. The policy also intends to address the concerns of traders related to deep discounts and preference to select traders.
- **Consumer Protection (e-commerce) Rules, 2020**
  - All electronic merchants that are registered in India or outside and provide goods and services to Indian consumers are subject to certain rules.
  - The complete cost of the products and services being sold, as well as the breakdown of additional fees, must be shown by the e-commerce companies.
  - It gives the Central Government the authority to take action against unfair trade practices in direct selling and online shopping.
  - Grievance Officers would need to be appointed by both sellers and marketplaces, and they would need to reply within a certain amount of time.
  - The violation of the rules will attract penal action under the **Consumer Protection Act 2019**.

Draft Consumer Protection (e-commerce) Rules, 2021

- E-commerce firms are mandatorily required to register with the **Ministry of Commerce and Industry's Department of Promotion for Industry and Internal Trade (DPIIT)**.
- The **Chief Compliance Officer (CCO)** and a nodal contact person must be appointed by the e-commerce sites to facilitate round-the-clock interaction with law enforcement.
- The new regulations aim to guarantee that no related parties are permitted to utilize any consumer information from the online platform in order to address the growing concerns about preferential treatment.
- Certain flash sales or back-to-back deals that restrict customer options, raise costs, and obstruct fair competition are prohibited.
- Along with identifying items according to their country of origin, the businesses will also need to give buyers access to a filtering mechanism prior to their purchase.
- All e-commerce companies are required to respond to requests for information from authorised government agencies investigating legal violations, including cybersecurity-related ones, within 72 hours.

STARTUPS

General Data

- According to NASSCOM, India has emerged as the third largest startup ecosystem in the world after China and the USA. The number of start-ups is growing significantly in the country with 10% being added every year.
- India has the second-largest ecosystem for tech startups.
- Tier-II and tier-III cities are home to about 40% of startups.

Jobs created by Startups are on a constant increase since the past five years.

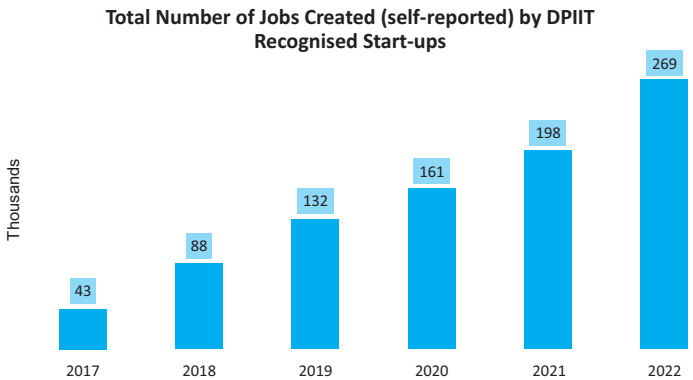


Fig. 16.3: Jobs Created by Start-ups (Economic Survey 2022-23)

Initiatives Taken by The Government

- **Startup India Seed Fund Scheme**
  - It was launched by the **Ministry of Commerce and the Department for Promotion of Industry and Internal Trade** (DPIIT).
  - The primary goal of the scheme is to give entrepreneurs financial support in the form of seed money.
- **National Initiative for development and Harnessing Innovation (NIDHI)**
  - It is launched by the **Department of Science and Technology.**
  - Under this initiative, programmes for setting up of incubators, seed funds, accelerators, and 'Proof of concept' grants for innovators and entrepreneurs are launched for nurturing ideas and innovations (knowledge-based and technology-driven) into successful startups. (eg: supports established Technology Business Incubators with PRAYAS grants to support innovators and entrepreneurs with grants for 'Proof of Concept' and developing prototypes)
- **SCO Start-up Forum**
  - It was launched to promote the startup ecosystem in Shanghai Cooperation Organisation countries.
- **Ranking of States on Support to Startup Ecosystems (RSSSE)**
  - Since 2018, the States' Start-up Ranking Exercise has been carried out by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.
- **Prarambh**
  - The Startup India International Summit has been organised by the **Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry.**
  - It seeks to strengthen and expand startup ecosystems globally by promoting multilateral cooperation and interaction with nations.
- **National Startup Awards**
  - The initiative was launched by the **Ministry of Commerce and Industry** in 2016.
  - This initiative honours and grants awards to exceptional startups and ecosystem facilitators.

Major Challenges Related to Startups in India

- The Indian higher education system lags behind in terms of research and development thus lacking forward thrust to innovation.
- Many start-ups in India, especially at early stages, are self-funded through the founders' own savings since domestic financing is limited.
- Numerous start-ups in villages lack recognition and are not eligible for government funding programs.
- Risk-taking attitude is not promoted in India, which is crucial when it comes to starting a startup.
- There is a shortage of seasoned mentors who can offer advice on several facets of business development, strategy, and networking for many startups.
- Inadequate logistics and infrastructure can be a barrier in some industries. This is especially true for new businesses that are involved in supply chain management, manufacturing, and transportation.
- For entrepreneurs, protecting intellectual property is essential, but the legal procedures involved in obtaining a patent and obtaining a copyright can be expensive and time-consuming.

Way Forward

- The National Education Policy (NEP) of 2020 has established a specific objective of introducing skilling and vocational education to 50% of school students by the year 2025, which if implemented in spirit, will boost the startup ecosystem in India.
- The government must endeavour to promote entrepreneurship as a socially acceptable career path and guide young people toward easy career decisions.
- Indian businesses should be encouraged to work with startups and provide them with a range of corporate-specific resources.
- The digital divide must be taken care of to boost the recognition of startups in villages.

INSURANCE SECTOR

Introduction

Insurance is a financial arrangement that provides protection against potential financial losses or risks. It involves the transfer of risk from an individual or entity to an insurance company in exchange for a premium. The basic idea behind insurance is to spread the risk among a large group of people so that the financial burden of an unexpected event is shared.

Insurance provides financial security in the event of a loss from an unexpected occurrence. It provides support to the policyholder and reduces uncertainties in business and human lives.

Insurance Penetration in India

India's insurance penetration rate was estimated for FY21 to be **4.2%, consisting of 3.2%** for life insurance and **1% for non-life insurance**. A report titled **"Health Insurance for India's Missing Middle"** by NITI Aayog estimates that 30 percent of the population (Approx. 40 crore individuals) are lacking means of financial protection.

Importance of Insurance

- Insurance businesses pool a lot of money, which contributes to economic growth. This money may be used in part to fund investments.
- Social Security and Medicare are two examples of social insurance programs that help people financially when they retire or are in need.
- It protects individuals and businesses from monetary fines and legal actions should they be judged responsible for the harm they bring to others.
- Insurance helps shield priceless possessions against unforeseen circumstances, such as homes, vehicles, and personal items.
- In order to reduce their risk, lenders may demand insurance when making loans for residences, cars, or enterprises.

Life Insurance Corporation

The biggest and one of the country's oldest insurance Company is the Life Insurance Corporation of India (LIC). LIC was created in 1956 when private insurance companies that were already in operation were nationalized.

Objectives of LIC

- Bringing down out-of-pocket expenditure in case of health emergency.
- Mobilising money from the people for further investment.

LIC has a share of around 70% in terms of first-year premium income. However, the government has announced the IPO of LIC shares in the budget 2020-21.

A life insurance policy provides financial support to the policy holder or designated beneficiaries in the event of an insured person's death or other specified event.

General Insurance Corporation

- GIC is a government-owned insurance company under the Ministry of Finance.
- On November 22, 1972, the GIC was established in accordance with the Companies Act of 1956. The Act nationalised 107 private insurance companies.
- Following its merger and consolidation, GIC was restructured into four subsidiaries, namely United India Insurance Company, Oriental Insurance Company Limited, New India Assurance Company Limited, and National Insurance Company Limited.
- The Government now owns all four of the companies, as GIC withdrew its ownership stake in them.

A general insurance policy shields you from losses and damages (like fire, home, etc.) that aren't covered by life insurance.

Agriculture Insurance Company of India

- It is central public sector undertaking under the ownership of **Ministry of Finance**. It was incorporated under Indian Companies Act 1956, in 2002.
- Farmers are covered by insurance through AIC against monetary losses resulting from crop failure.
- AIC engages in various insurance-related transactions pertaining to agriculture and its associated activities, either directly or indirectly.
- It is promoted by 6 Public Sector Financial Institutions, among which the General Insurance Corporation of India, with 35% shares, is the largest shareholder, followed by the National Bank of Agriculture and Rural Development (NABARD), with a shareholding of 30%.

Deposit Insurance and Credit Guarantee Corporation

- DICGC was created in 1978 through the merger of Deposit Insurance Corporation (DIC) and Credit Guarantee Corporation of India Ltd. (CGCI).
- It acts as a credit guarantee and deposit insurance for Indian banks.
- DICGC insures all bank deposits, such as savings, fixed current, and recurring deposits for up to the limit of ₹ **500,000 for each depositor in a bank**. (If one has multiple accounts in a single bank, one will be given a maximum of ₹ 500000 only in case of bank failure).
- The bank (not the customer) pays the premium amount for insurance.
- DICGC is under the RBI's jurisdiction and is a wholly-owned subsidiary.

- **It is mandatory to take deposit insurance cover from DICGC by the following entities:**
  - All Schedule Commercial Banks
  - Regional Rural Banks
  - Local Area Banks
  - Foreign banks with branches in India
  - Cooperative Banks
- **No insurance cover is provided for the following:**
  - Deposits of Foreign Governments.
  - Deposits of Central/State Governments.
  - Inter-bank deposits.
  - Any amount due on account of any deposit received outside India.
  - Deposits of the State Land Development Banks with the State co-operative banks.
  - Any amount that the corporation has specifically excluded with the RBI's prior approval.

Insurance Reforms

Insurance sector reforms in India started with the formation of the **Malhotra Committee** in 1993 under the chairmanship of ex-RBI Governor R.N. Malhotra. The key recommendations of the committee were:

- Reduce the Government's shareholding in insurance companies to 50%.
- For the insurance industry, a regulatory body ought to be established (the Insurance Regulatory Authority of India was established in 1999).
- LIC needs to be converted to a company under the Companies Act of 1957.
  - Now, insurance companies are registered under the Companies Act 1957.
- A billion rupees should be the minimum capital required for private companies to enter the market.
- One company can either deal with general insurance or with life insurance.
- To get international companies into the Indian market, partnerships between foreign and domestic businesses are necessary (FDI has been increased to 74% under automatic route in the insurance business).

Emerging Trends

- India is ranked 10th in life insurance and 14th in non-life insurance in the world.
- The Indian insurance industry grows at an average annual rate of 12.2%.
- Despite recent rapid growth, India's insurance market share is still pitifully small compared to other countries. India's share in the global insurance market was 1.72% during 2020.

Favourable Policy Measures

- The government has increased the limit of foreign investment under the automatic route to 74%.
- Initiatives in the Insurance Sector by the Insurance Regulatory and Development Authority of India (IRDAI) in FY23:
  - The **Single Window NOC Portal (www.noc.irdai.gov.in)** was introduced to streamline the insurer incorporation process by providing prompt, hassle-free access to the NOC.
  - Insurers can now launch all Health and General Insurance products, as well as the majority of Life Insurance products, without seeking prior approval from IRDAI, thereby reducing the time taken to launch a new product in the market from a few months to a few days.
  - IRDAI has taken several actions to lessen the burden of compliance.
  - More flexibility to the regulated entities in the areas of operational and business decisions is being considered.
  - In response to the changing needs of the industry, IRDAI has enabled a number of measures, including tech-based add-ons (general insurers are now allowed to introduce tech-enabled concepts for motor insurance, such as Pay as You Drive and Pay How You Drive), an expansion of the cashless facility's reach in the health insurance market, innovative fire insurance products, Senior citizens' ease of living etc.
- LIC, GIC, and New India have been identified as **Domestic Systemically important insurers** to avoid systemic risks.
- Tax incentives have been provided to senior citizens and health insurance products.

Insurance Schemes Backed by The Government

Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana

- With full government funding, PM-JAY is the largest health insurance program in the world.
- Introduced in February 2018, it provides a 5 lakh rupee sum insured for secondary and tertiary care per family.
- Health Benefits Packages pay for diagnostics, medications, surgery, medical care, and daycare expenses.
- The **National Health Authority**, registered under the Society Registration Act 1860, is the nodal implementing agency. At the state level, the State Health Agency implements the scheme.
- **Socio-Economic Caste Census (SECC) data is used to identify the beneficiaries.** States and UTs now have the option to utilize a socio-economic Caste Census beneficiary family database that shares a comparable socio-economic profile to tag unauthenticated SECC families.
- **Funding Pattern**
  - 60 : 40 for all states and UTs with their own legislature.

- 90 : 10 in Northeast states and Jammu and Kashmir, Himachal and Uttarakhand
- 100% Central funding for UTs without legislature.

Pradhan Mantri Jeevan Jyoti Bima Yojana

- It was launched by the **Ministry of Finance,** in 2015.
- Life Insurance Corporation and all other life insurers willing to participate in the program and collaborate with banks towards this end will offer the scheme.
- It is accessible to anyone with a bank account who is between the ages of 18 and 50. However, individuals who enroll in the program before turning 50 years old may still be eligible for life insurance up until the age of 55, provided they continue to pay premiums.
- Premium is ₹ 436 per annum, excluding service tax.
- ₹ 2 Lakh will be given in case of death for any reason.

Pradhan Mantri Suraksha Bima Yojana

- It was launched by the **Ministry of Finance** in 2015.
- It is accessible to anyone with a bank account who is between the ages of 18 and 70.
- The premium is ₹ 20 per annum.
- The scheme provides one lakh rupees for partial disability and two lakhs rupees for accidental death and total disability.
- All Public Sector General Insurance Companies and other insurers willing to participate in the program and collaborate with banks towards this end will offer the scheme.

TOURISM SECTOR

General Data

- India is the 8th largest tourist economy (World Travel and Tourism Council).
- The World Travel and Tourism Council projects that by 2028, the tourism sector will account for about 9.8% of the Indian GDP.
- Domestic travel accounts for 88% of the sector's contribution to GDP (MoSPI).
- As per the Global Travel and Tourism Development 2021 report, India dropped from 46th (2019) to 54th place in 2022.
- Tourism sector's share in nation's GDP declined from 7% in 2019 to about 4.7% in 2020 (MoSPI) due to Covid-19.

Key Targets

- India's tourism industry is on track to reach $1 trillion by 2047, with data-led tourism set to be a key driver of growth.
- Reach a **$250 billion** tourism-related GDP contribution **by 2030**.
- To increase India's proportion of **MICE** (Meetings, Incentives, Conferences, and Exhibition) **tourism** from its current level of about 1% to 2% in five years.
- Build **Brand India** for health and wellness travel.
- To make travel to India traveler-friendly by bringing in necessary interventions.

Challenges in The Growth of The Tourism Industry in India

- Lack of transportation facilities (e.g., there are no proper roads to connect to many locations in the Great Himalayas).
- Lack of proper accommodation facilities also hinders the prospects of tourism in a particular location.
- Overcrowding and overdevelopment in some tourist locations (eg: Shimla, Joshimath) have made the areas prone to a mix of natural and man-made disasters.
- Competition from other Asian countries like Singapore, Thailand, etc.
- Luxury tourism is heavily taxed, which obstructs it to reach its potential.
  - the 28% GST rate is applicable to the supply of food/ drinks in an air-conditioned restaurant in a 5-star or above-rated hotel.

Tourism Initiatives by Government of India

Swadesh Darshan 2.0	❑ Central sector scheme by **Ministry of Tourism**. ❑ The implementing agency is to be designated by the Central or State government. ❑ The center gives financial assistance to states and UTs for 13 theme-based tourist circuits with a focus on sustainability and responsible tourist destinations. ❑ **Major themes under the scheme:** • Culture and Heritage • Adventure Tourism • Eco-Tourism • Wellness Tourism • MICE Tourism • Rural Tourism • Beach Tourism • Cruises – Ocean and Inland

National Mission on Pilgrimage Rejuvenation And Spiritual Augmentation Drive Scheme (PRASAD)	❑ Initiated in 2014–15 by the **Ministry of Tourism.** ❑ For Restoration and spiritual enhancement of significant national and international tourist destinations and historical sites. ❑ Implementing agencies would be identified by the respective State/ Union Territory Government.
Draft National Strategy for MICE, Medical and Wellness and Rural Tourism	❑ Formulated by the **Ministry of Tourism.** ❑ **Major Strategies:** • Promote "Meet in India" Brand for MICE Industry. • Provide Infrastructure status for financing of MICE infrastructure. • To promote India as an Medical Value Travel (MVT) destination, use the "Heal in India" brand. • Setting up an MVT portal to make access easy for international patients. • Converge Wellness, Hospitality and Travel businesses. • Develop clusters for rural tourism. • Enable digital technology to promote rural tourism (eg: increasing broadband connectivity in rural areas).
'Dekho Apna Desh' Campaign	❑ This initiative was launched by the **Ministry of Tourism** in 2020. ❑ It is an effort to motivate people to travel extensively within their own nation.
NIDHI (National Integrated Database of Hospitality Industry)	❑ A portal maintained by the **Ministry of Tourism** is being used to register lodging units across the nation with assistance from State Governments and Union Territory Administrations. The comprehensive database will help in formulating effective policies.
SAATHI (System for Assessment, Awareness, and Training for Hospitality Industry)	❑ The objective of the scheme is to sensitise the industry to the Covid-19 regulations of the government.
Loan Guarantee Scheme for COVID-Affected Tourism Sector	❑ A collateral free loan of up to 10 lakh will be provided.
Incredible India 2.0	❑ The Incredible India 2.0 campaign is centred on products for niche markets, such as yoga, wellness, luxury, and wildlife cuisine.
RCS-UDAN 3.0	❑ The program covered a number of routes in the Northeast Region in addition to seaplanes that connected water aerodromes. ❑ It is being implemented by the **Ministry of Civil Aviation**. ❑ The total number of Tourism RCS air routes has increased to 59, out of which 51 are presently operational.
Draft National Tourism Policy	❑ The policy provides for a **National Tourism Advisory Council (NTAC)** chaired by the Union Minister for Tourism and comprising all the Tourism Ministers of the States. ❑ Key Objective of the Scheme: • To enhance the contribution of tourism in the Indian economy. • To enhance the supply of skilled workforce and create jobs. • To enhance the competitiveness of the tourism sector and attract private sector investment. • To preserve and enhance the cultural and natural resources of the country, • To ensure sustainable, responsible and inclusive development of tourism in the country.

Medical Tourism

The practice of people going to another country for medical treatment, often for procedures or services that may be more accessible, affordable, or of higher quality in the destination country is known as medical tourism.

- ❑ India is **ranked 10th** out of 46 destinations worldwide in the **Medical Tourism Index** (MTI) for 2020–2021, according to the Medical Tourism Association.
- ❑ India's medical tourism industry is currently estimated to be worth $3 billion.

- India is a well-liked destination for medical tourism because of its top-notch hospitals, highly qualified medical staff, affordable treatment costs when compared to other nations, reputation in complementary and alternative medicine, and rising demand for wellness services like yoga and meditation worldwide.

Issues Pertaining To Medical Tourism in India

- The communication barrier poses a challenge for medical tourists.
- Variations in standards of medical services across India are also a problem.
- Medical tourism may face difficulties due to variations in ethical and legal norms among nations.
- Patients undergoing medical treatments in remote or less urbanised areas may encounter transportation and accessibility challenges.

Initiatives By The Government

- For 156 countries, the **"E-Medical Visa" and the "E-Medical Attendant Visa"** have been introduced.
- Ayush Visa for tourist who desire to visit India for medical tourism.
- Launch of National Strategy for Sustainable Tourism and Responsible traveller campaign.
- Heal in India initiative which aims to promote Medical Value Travel in the country, MoHFW, India has developed the Medical Value Travel Digital Portal for ease of foreign patients coming to India for treatment.
- **indiahealthtourism.com** has been launched in three languages, i.e. Arabic, Russian, and French, by the Commerce Ministry in cooperation with the Ministry of Tourism and the Ministry of Health to provide comprehensive information to travellers.

Way Forward

- The creation of health infrastructure and training health service providers is the need of the hour.
- Stress upon the value of providing exceptional customer service, which includes individualized attention and language support.
- Acquire and advertise globally acknowledged quality certifications for healthcare establishments to cultivate confidence and legitimacy among prospective clients.
- Work together with the regional travel industry to develop packages that combine travel and healthcare.
- Give prospective patients the chance to talk about their medical concerns via telemedicine consultations before they decide to book a trip.
- Share patient testimonials, success stories, and details about medical services on social media platforms.

Eco-Tourism

According to data by the **United Nations World Tourism Organizations (UNWTO)**, transport-related emissions from tourism represented 5% of all man-made emissions in 2016 and will increase to 5.3% by 2030.

Eco-tourism is a way to make tourism eco-friendly while addressing cultural sensitivities, the well being of the inhabitants, and tourist satisfaction.

Ecotourism is a novel approach for the tourism industry that involves travelling to natural locations without disturbing the ecosystem integrity and creating opportunities for economic benefits & well being for the local communities.

Promoting biodiversity, protecting the environment, and enhancing the welfare of local populations are the three main objectives of ecotourism.

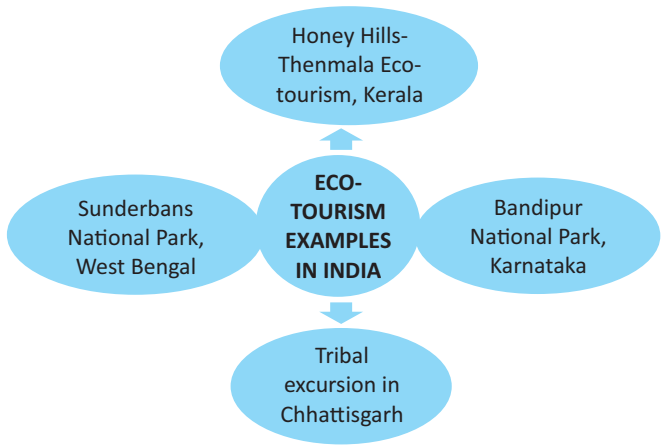

Honey Hills-Thenmala Eco-tourism, Kerala
Sunderbans National Park, West Bengal
ECO-TOURISM EXAMPLES IN INDIA
Bandipur National Park, Karnataka
Tribal excursion in Chhattisgarh

Fig. 16.4: Example of Eco-Tourism in India

Sustainable Tourism v/s Eco Tourism

- Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities is called sustainable tourism (UNEP).
- Eco-Tourism involves environmentally responsible travel to untouched natural regions only.

Conventional Tourism vs Eco-Tourism

Characteristics	Conventional Tourism	Eco-Tourism
Nature of attractions	General and specifically built for tourism purpose	Natural and Authentic
Volume	Large group of people	Small group of people
Seasons	Season specific	No specific seasons

Characteristics	Conventional Tourism	Eco-Tourism
Focusses on	Tourist satisfaction only	Tourist satisfaction, Environment Protection and Local communities well being
Earning	High	Low to Moderate
Tourist's role	Prevailing	Supplementary
Regulation	Free	Intervening
Objective	Profit and Growth	Community wellbeing and Preservation of culture
Length of stay	Short	Long

Need of Eco-Tourism

- It becomes easier to reach out to rural populace and understand their living conditions and culture. Thus it can help to promote sustainable livelihood options for rural people and sustainable development of the area.
- It helps in the conservation of cultural heritage.
- With the right observation and analysis, the conservation of the environment becomes easy.

Benefits of Ecotourism

- Ecotourism aids in the preservation of ecosystems, threatened species, and their habitats by encouraging ethical travel habits.
- Visitors can learn about and get an appreciation for the natural environment through ecotourism thus it promotes environmental education.
- Ecotourism activities empower local communities as the activities are frequently planned and run by local communities.
- Protected areas and wildlife reserves may be established as a result of governments and local authorities realising the ecological significance and financial advantages of maintaining natural places.

Challenges

- The Influx of visitors can disturb the wildlife and cultural practices of the local community.
- Overcrowding and infrastructure development can disrupt natural habitats and increase pollution.
- Increased tourism activity can increase the chances of unsustainable use of natural resources.
- Over time local control over the eco-tourism activities can erode.

Way Forward

- Enhance the participation of local bodies of governance and people.
- Education and skill-building in eco-tourism.
- Levy green tax on tourist vehicles to develop the area sustainably.
- Marketing of the practice of sustainable tourism sites and practices.

COMMUNICATION SECTOR

Services related to communication are the different instruments, systems, and platforms that help people, organisations, or other entities share ideas, information, and messages. For example email services, telecommunication services, video conferencing etc.

Telecom Sector

Related Data

- The Indian telecom sector is 2nd largest in the world (TRAI).
- India is a country with the 2nd highest global internet subscriber count (TRAI).
- Overall tele-density is 82.46%. Urban tele-density stands at 134.71% and rural- tele density is 58.44% (TRAI).
- India has over 1.2 billion mobile phone users and 600 million smartphone users (Ministry of Information and Broadcasting).
- India is the 2nd largest smartphone market.
- With approximately 6% of all FDI inflow, it is the third largest sector in terms of FDI inflow (PIB).

Key Targets For The Sector

- Ensure Digital Sovereignty.
- Increase industry contribution to 8% of India's GDP.
- Increase participation in the Global Value Chain.

Key Challenges Faced By The Sector

- Lack of internet penetration and telecom infrastructure in semi-rural and rural areas.
- Cut throat competition in the sector especially after the advent of Jio.
- Exorbitant spectrum usage fees in contrast to other nations.
- Available spectrum is way less than China (50% less) and European nations (40% less).
- There has been litigation over the definition of adjusted gross revenue (AGR) for the past 14 years.
- Cost of investment in 5G infrastructure.

Initiatives By The Government

- **National Digital Communication Policy 2018**

  Objectives

  - Broadband for all.
  - Creating four million additional jobs in the Digital Communications sector.
  - Enhancing the contribution of the Digital Communications sector to 8% of India's GDP from ~ 6% in 2017.
  - Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017.
  - Enhancing India's contribution to Global Value Chains.
  - Ensuring Digital Sovereignty.

  Features

  - Provide universal broadband connectivity at 50 Mbps to every citizen.
  - Provide 1 Gbps connectivity to all Gram Panchayats by 2020 and 10 Gbps by 2022.
  - Ensure connectivity to all uncovered areas.
  - Attract investments of USD 100 billion in the Digital Communications Sector.
  - Train one million manpower for building New Age Skill.
  - Expand IoT ecosystem to 5 billion connected devices.
  - Establish a comprehensive data protection regime for digital communications that safeguards the privacy, autonomy and choice of individuals.
  - Facilitate India's effective participation in the global digital economy.
  - Enforce accountability through appropriate institutional mechanisms to assure citizens of safe and Secure digital communications infrastructure and services.

- **Telecom Technology Fund**
  - The goal of TTDF is to create partnerships between academia, start-ups, research institutions, and industry to foster innovation in communication technology applications tailored to rural areas, with the ultimate goal of advancing the telecom ecosystem.
  - Under the scheme, Indian entities will receive grants to support and introduce indigenous technologies that are specifically designed to meet domestic needs.
- The Government has fixed the Auction Calendar to increase the certainty in the sector.
- There is a PLI scheme under Atmanirbhar Bharat Abhiyan for manufacturing of telecom and networking projects.
- Exclusion of non-telecom revenue from the definition Of AGR.
- The telecom companies would be exempt from paying any spectrum usage charges for airwaves they win in upcoming auctions.
- **BharatNet Project**
  - It is the largest optical fiber-based rural broadband connectivity program in the world and a flagship project carried out by Bharat Broadband Network Ltd. (Special purpose vehicle under the Companies Act, 1957)
  - The Universal Service Obligation Fund is providing funding for the entire project (USOF)
  - Union Cabinet has approved a Viability Gap Funding support for the implementation of the BharatNet project through the Public-Private Partnership model.
- **PM WANI (Wi-Fi Access Network Interface)**
  - This will enable the establishment of public Wi-Fi hotspots through public data offices (PDOs) across the nation.
  - The PDOs won't have to apply for a license or pay a fee.

  Current status of 5G in India

  - Prime Minister launched the 5G services on 1st Oct 2022 and within 8 months of launch, 2,00,000 sites covering 700 districts have been installed. The 5G network has been rolled out in all 28 states and 8 UTs now. This is one of the fastest 5G rollouts in the world. (PIB)

  Intended benefits of 5G

  - Internet of things, and smart cities rely heavily on 5G technology.
  - In the future, smart farming and agriculture may benefit from 5G technology. Smart sensors can be used for irrigation control, access control, and energy management.
- **5G**

  Initiatives taken by the Government

  - The government established a **5G High-Level Forum** in September 2017 to outline the country's 5G vision and provide legislative measures and implementation strategies to bring it to fruition.
  - DST and MEITY have also provided funding for a number of smaller university R&D projects centred on 5G issues.
  - The following goals are also outlined in the **National Digital Communication Policy-2018** (NDCP-2018) with regard to 5G services in India:
    - Guaranteeing spectrum availability in 6 GHz bands for 5G.
    - Examining industry standards for traffic prioritisation in order to deliver services and applications that support 5G.
    - Creating a framework to ensure M2M device security and interception while accelerating the deployment of M2M services
  - In February 2021, the **Departmentally Related Standing Committee on Information Technology**, led by Dr. Shashi Tharoor, turned in its report regarding

India's 5G readiness. The following observations and suggestions were given by the Committee:

- 5G has mostly been launched at a limited scale so far. In India, the commercial rollout of 5G is yet to happen.
- Allocation of new bands of spectrum is crucial for the rollout of 5G. However, the auction of 5G spectrum is still pending.
- The Committee further noted that based on the current availability of spectrum, approximately 50 MHz spectrum per operator can be ensured. This is substantially lower than the global average of about 100 MHz per operator.
- The Committee observed that India is greatly dependent on the import of telecom equipment. 5G presents an opportunity for the promotion of the domestic manufacturing industry.
- The Committee noted that connectivity through the fibre is an important requirement for the rollout of 5G services. However, only about 30% of the towers are fiberized and less than 7% of households are connected through fiber.

- It will enable medical professionals to carry out cutting-edge medical procedures. Physicians can communicate with their patients at any time and from any location, offering advice as needed, thus promoting telehealth.
- It will assist in industrial automation.

- **Draft Telecommunication Bill, 2022:**

There has been a noticeable change in the way people consume content due to the growing popularity of services like Netflix, Amazon Prime etc. which emphasises the importance of OTT regulation. In order to do that, the Department of Telecommunications released the draft Indian Telecommunications 2022 Bill.

Salient Features:

- Three existing acts that regulate the telecom industry are combined in the draft bill.
- The bill suggests that OTT communication services would need a licence to operate by placing them under the purview of telecom services.
- Limitations have been put on the Telecom Regulatory Authority of India's authority, particularly with regard to licence issuance.
- When licensees fail to make payments, the government may offer several forms of relief.
- The bill suggests a provision for fee reimbursement in the event that a telecom or internet provider surrenders their licence.
- The assigned spectrum returns to government control in the event of insolvency.
- Bill proposes renaming the Universal Service Obligation Fund as Telecommunication Development Fund to support the introduction of new telecommunication services and improve connectivity.

The Union Cabinet (in Aug, 2023) has the Indian Telecommunication Bill 2023. It provides certain relaxation in regulating OTT communication services. The bill seeks to replace three laws- Indian telegraph Act, 1885, the Indian

DIGITAL FINANCIAL SERVICES

Digital financial services that are made possible by cutting-edge technologies and creative solutions are democratising access, increasing financial inclusion, and encouraging product personalization.

Initiatives Taken to promote Digital Financial Services

- **JAM** (short for Jan Dhan-Aadhaar-Mobile) **trinity** refers to the government of India initiative to link Jan Dhan accounts, mobile numbers and Aadhaar cards of Indians to plug the leakages of government subsidies has aided acceleration in digital adoption and provided a fillip to digital financial services solutions especially during pandemic.
- NPCI's reinforcement of the **Unified Payment Interface** (UPI) has made digital payments more secure than they were in the past thus promoting digital payments.
- The Union Budget 2022–2023 announced the launch of 75 **Digital Banking Units** (DBU) spread over 75 districts with the goal of bringing banking solutions to every corner of the nation.
- **Central Bank Digital Currency (CBDC) or E-rupee:**
  - In contrast to cryptocurrencies, which function without government oversight, CBDCs are digital versions of paper money that are issued and guaranteed by central banks.
  - It is equivalent to fiat money and can be exchanged for it one for one.
  - Wallets supported by blockchain technology can be used to transact in the digital fiat currency, or CBDC.
  - Pilot programs for digital rupee were introduced by the RBI in November 2022 for the wholesale market and in December 2022 for the retail market.
- **Account Aggregator Framework:**
  - Account Aggregator (AA) is a **Non-Banking Financial Company (NBFC)** engaged in the business of providing the service of retrieving or collecting financial information pertaining to the customer.
  - AA transfers data from one financial institution to another based on an individual's instruction and consent.
  - Entities that may enroll themselves on AA framework as Financial Information Provider (FIP):

- Banking company,
- Non-banking financial company,
- Asset management company,
- Depository,
- Depository participant,
- Insurance company,
- Insurance repository,
- Pension fund etc.

- Entities can also enroll as Financial Information User (FIU) which is an entity registered with and regulated by any financial sector regulator.

❑ **NeSL-DDE platform:**

- National e-Governance Services Limited (NeSL), an Information Utility registered with and regulated by the Insolvency and Bankruptcy Board of India introduced the Digital Document Execution (DDE) platform in 2020.
- The core principle of the NeSL-DDE platform is to digitise all the steps of the document/agreement execution journey. These include:
  - Submission of data and agreement to be executed on the platform,
  - Flexibility to accept any format for the agreement or document,
  - Consent-based procedure,
  - Digital stamp duty payment and affixing of the digital e-stamp certificate,
  - Electronic signature verification of the executants' identities and digital execution
  - Secure storage, transmission, and retrieval of the digitally executed document created via the platform.

Challenges in Promoting Digital Financial Services

- ❑ Lack of digital literacy is the major challenge, especially in rural areas.
- ❑ Linguistic diversity is also a barrier as most of the digital services are provided in English.
- ❑ Lack of collaboration between fintech companies and traditional banks can enhance the reach and impact of digital financial services.
- ❑ Unfamiliarity with digital transactions and security concerns related to online payment hampers adoption of digital financial services.
- ❑ Rural-tele density is 58.44% (TRAI) which is way less than urban teledensity hampers the growth of digital financial services in rural areas.

CONCLUSION

In the fiscal year 2023 (FY23), India's services sector rebounded strongly from previous instability, driven by released pent-up demand, eased mobility restrictions, widespread vaccination, and government initiatives. Key areas such as tourism, hotels, real estate, IT-BPM, and e-commerce have shown significant improvement. However, potential external challenges like trade wars, preferential bilateral agreements, and the global economic climate could impact future growth.

Infrastructure

17

INTRODUCTION

Since gaining independence, the Indian government assumed complete responsibility for developing the entire spectrum of infrastructure, encompassing areas such as roads, railways, ports, airports, and power. However, owing to the capital-intensive requirements and limitations in financial and human resources, a significant shift occurred in the post-1991 period, marked by the LPG (Liberalization, Privatization, Globalization) reforms.

During this era, the government transitioned towards actively engaging the private sector to address the substantial infrastructure gap prevalent in the country. This shift aimed to leverage private investment, expertise, and efficiency to supplement government efforts in developing and maintaining critical infrastructure projects.

INFRASTRUCTURE

- Infrastructure encompasses fundamental facilities that support socio-economic development and contribute to the production activities within the economy. Key characteristics of infrastructure include:
  - Physical infrastructure services inherently exhibit characteristics of a **public good**.
  - Infrastructure **generates externalities**, meaning the benefits derived from infrastructure services surpass the costs incurred in their creation.
  - The infrastructural development sector has traditionally been **dominated by the public sector**. Nevertheless, there is a growing emphasis on promoting public-private partnership (PPP) projects through government initiatives.

Types of Infrastructure

- Infrastructure can be broadly categorized into **Economic Infrastructure and Social Infrastructure**.
- It can be further categorized into several types based on the functions and sectors they serve. Some common types of infrastructure are given below:
  - **Transportation Infrastructure:**
    - Roads and highways, Railways, Airports, Ports and harbors, Public transit systems (buses, subways, etc.)
  - **Energy Infrastructure:**
    - Power generation plants (thermal, hydroelectric, nuclear, renewable), Transmission and distribution networks, Oil and gas pipelines

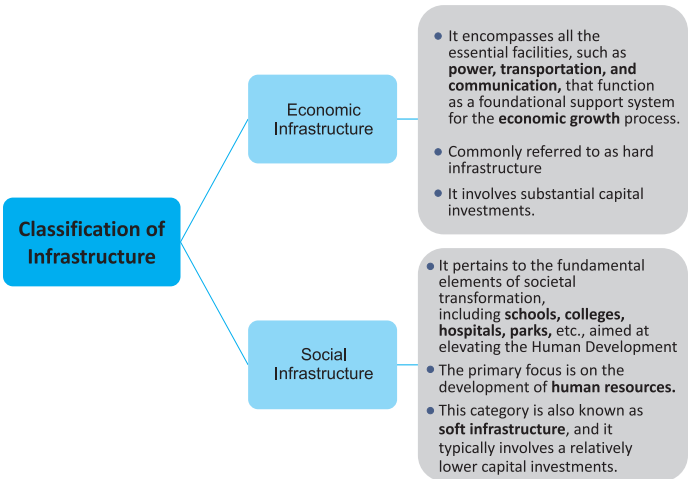

Classification of Infrastructure
Economic Infrastructure
It encompasses all the essential facilities, such as power, transportation, and communication, that function as a foundational support system for the economic growth process.
Commonly referred to as hard infrastructure
It involves substantial capital investments.
Social Infrastructure
It pertains to the fundamental elements of societal transformation, including schools, colleges, hospitals, parks, etc., aimed at elevating the Human Development
The primary focus is on the development of human resources.
This category is also known as soft infrastructure, and it typically involves a relatively lower capital investments.

Fig. 17.1: Classification of infrastructure

- **Communication Infrastructure:**
  - Telecommunication networks (fiber optics, wireless), Internet infrastructure (data centers, servers, broadband)
- **Water and Sanitation Infrastructure:**
  - Water supply systems, Sewage and wastewater treatment plants, Irrigation systems
- **Tourism Infrastructure:**
  - Hotels and accommodations, Tourist attractions and facilities
- **Environmental Infrastructure:**
  - Waste management and recycling facilities, Pollution control systems
- **Social Infrastructure:**
  - Educational institutions (schools, colleges, universities), Healthcare facilities (hospitals, clinics), Public housing
- **Public Safety Infrastructure:**
  - Police stations and law enforcement facilities, Fire stations, Emergency response and disaster management systems
- **Financial Infrastructure:**
  - Banking institutions, Stock exchanges, Payment and settlement systems
- **Digital Infrastructure:**
  - Broadband networks, Data centers, Cybersecurity systems

Critical Infrastructure

Critical infrastructure refers to the fundamental systems, assets, and networks, whether physical or virtual, that are vital for the functioning of a society and its economy.

The protection and resilience of critical infrastructure are crucial for national security, economic stability, and public well-being.

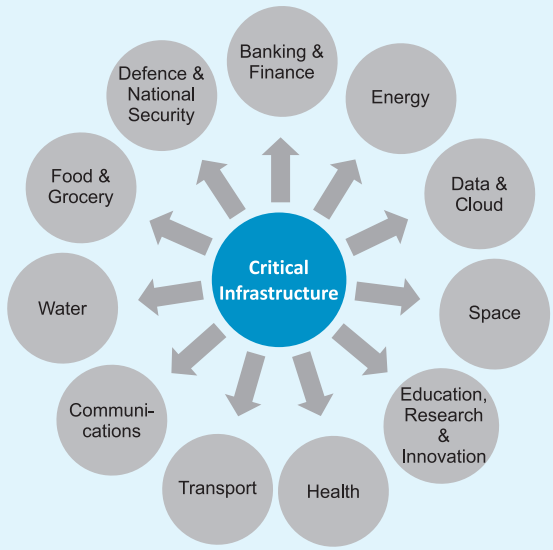


Fig. 17.2: Critical Infrastructure

Each type of infrastructure plays a crucial role in supporting economic activities, enhancing quality of life, and fostering overall development in a region or country.

Contribution of Infrastructure in Economic Development

Infrastructure plays a pivotal role in fostering economic development, contributing to various aspects of a nation's growth:

- **Facilitates Trade and Commerce:**
  - Efficient transportation networks enable the smooth movement of goods and services.
  - Ports, airports, and logistics infrastructure support international trade.
- **Enhances Productivity:**
  - Robust energy infrastructure ensures a stable and sufficient power supply, boosting industrial productivity.
  - Technologically advanced communication infrastructure facilitates business operations.
- **Job Creation:**
  - Infrastructure projects generate employment, from construction to operation and maintenance.
- **Attracts Investments:**
  - Well-developed infrastructure attracts domestic and foreign investments.
  - Investors are more inclined to participate in regions with reliable utilities and transportation.
- **Improves Quality of Life:**
  - Adequate housing, healthcare, and educational infrastructure contribute to a higher quality of life.
  - Accessible public services enhance societal well-being.
- **Connectivity and Regional Development:**
  - Efficient roads, railways, and air connectivity reduce regional disparities.
  - Rural development is fostered through connectivity and amenities.
- **Innovation and Entrepreneurship:**
  - Modern infrastructure supports innovation hubs and entrepreneurial ecosystems.
  - Digital infrastructure fosters a conducive environment for technological advancements.

Infrastructure is Sine Qua Non for economic development. Industries rely on sectors like power, transportation, and communication. The service sector thrives with efficient human resources, achievable through soft infrastructure development. Neglecting infrastructure impedes a nation's economic progress.

India Infrastructure Report (IIR)

The India Infrastructure Report (IIR) 2023 on Urban Planning and Development, a collaborative effort by the **IDFC Foundation, iDeCK, and NIUA,** offers a comprehensive overview of infrastructure planning, finance, and governance in India.

Key highlights include a **thematic focus** on urban challenges, **critiquing existing planning mechanisms** for contributing to urban issues, addressing **low Floor Space Indices (FSIs) and urban sprawl,** advocating for **dynamic city building**, and emphasizing the **financial sustainability** of urban local bodies.

The report **underscores the role of PPPs and municipal bonds** for financing urban development projects and highlights the **need for increased dynamism** in city planning.

As an **annual publication**, it plays a crucial role in examining legal, fiscal, regulatory, technological, social, and conceptual facets linked to contemporary themes in infrastructure development. This makes it an **indispensable resource for urban policymakers,** investors, academics, financiers, and multilateral agencies, providing valuable perspectives on India's infrastructure development and urbanization.

Challenges in Infrastructure Sector

- **Funding and Financing:**
  - Many infrastructure projects require substantial investment, posing challenges in financing.

- Dependence on public funds may lead to budgetary constraints.

- **Regulatory Hurdles:**
  - Complex regulatory processes can delay project approvals.
  - Uncertainties in policies may deter private sector involvement.
- **Environmental Impact:**
  - Balancing development with environmental sustainability poses challenges.
  - Infrastructure projects must adhere to eco-friendly practices.
- **Project Management:**
  - Inadequate project management can lead to delays and cost overruns.
  - Skilled manpower shortages may affect project execution.
- **Technological Obsolescence:**
  - Infrastructure must keep pace with technological advancements to remain effective.
  - Outdated systems may hinder efficiency and competitiveness.
- **Geopolitical and Social Factors:**
  - Political instability and social resistance can impede infrastructure projects.
  - Public opposition to certain projects may result in delays.
- **Maintenance and Upkeep:**
  - Neglecting maintenance can lead to the deterioration of infrastructure.
  - Regular upkeep is essential for longevity and optimal performance.

Addressing these challenges requires a coordinated effort involving government initiatives, private sector participation, and community engagement to ensure sustainable and inclusive infrastructure development.

NATIONAL CRITICAL INFORMATION INFRASTRUCTURE PROTECTION CENTRE (NCIIPC)

- The National Critical Information Infrastructure Protection Centre (NCIIPC) is a governmental organization in India, established under **Section 70A of the Information Technology Act, 2000** (amended 2008).
- It was officially notified on January 16, 2014, through a gazette notification and is **headquartered in New Delhi**.
- NCIIPC holds the designation of being the National Nodal Agency **responsible for Critical Information Infrastructure Protection**.
- **NCIIPC has categorized the following as 'Critical Sectors':** Power and Energy, Banking, Financial Services, and Insurance, Telecom, Transport, Government, Strategic and Public Enterprises

Functions

- The National Critical Information Infrastructure Protection Centre (NCIIPC) serves as the national nodal agency overseeing the protection of the country's critical information infrastructure.
- Its responsibilities include **identifying and approving critical information** infrastructure elements, providing **strategic leadership** to address cyber threats, **coordinating threat intelligence**, and supporting the development of **protective strategies and standards**.
- NCIIPC engages in research, development, and collaboration for innovative technologies, conducts training programs, issues guidelines for protection, and facilitates national and international cooperation to ensure the resilience of Critical Information Infrastructure.
- In case of threats, NCIIPC can request information and issue directives to critical sectors or individuals impacting the Critical Information Infrastructure.

FINANCING INFRASTRUCTURE

- Financing infrastructure involves raising capital to fund the planning, development, and maintenance of essential physical and organizational structures such as transportation networks, energy facilities, water supply systems, and more.
- Various financing mechanisms are employed to support infrastructure projects:
  - **Public Funding:** Governments allocate budgetary resources to finance infrastructure projects. These funds may come from taxes, grants, or sovereign loans.
  - **Public-Private Partnerships (PPPs):** Collaboration between public and private sectors, where private entities participate in the financing, development, and operation of infrastructure projects. PPPs can involve various models like BOT (Build-Operate-Transfer), BOOT (Build-Own-Operate-Transfer), and concession agreements.
  - **Multilateral Development Banks (MDBs):** International financial institutions like the World Bank, Asian Development Bank, and others provide loans and financial assistance to support infrastructure development in countries.
  - **Bonds:** Governments and private entities issue bonds to raise funds for infrastructure projects. Investors purchase these bonds, providing the capital needed for construction and operation. Revenue generated from the infrastructure project may be used to repay bondholders.
  - **Private Equity:** Private investors or equity firms may invest directly in infrastructure projects, either independently or as part of a consortium. They often seek returns through project revenues or asset appreciation.

- **Infrastructure Funds:** Investment funds, managed by financial institutions, pension funds, or private firms, pool capital from various investors to invest in a diversified portfolio of infrastructure projects.
- **Development Assistance:** Grants and concessional loans provided by international organizations, donor countries, or philanthropic entities to support infrastructure development in less economically developed regions.
- **User Fees and Tolls:** In some cases, users directly contribute to financing infrastructure through fees, tolls, or charges. This model is common in transportation infrastructure.
- **Government Guarantees:** Governments may provide guarantees to attract private investment by mitigating risks associated with infrastructure projects, making them more attractive to investors.
- **Cross-Border Investments:** Countries may attract foreign direct investment (FDI) for infrastructure projects, especially in strategic sectors like energy, transportation, and telecommunications.
- **Innovative Financing:** This includes exploring new financial instruments and mechanisms, such as green bonds, impact investments, and crowdfunding, to fund sustainable and socially beneficial infrastructure projects.

Effective infrastructure financing involves a mix of these mechanisms, tailored to the specific needs, risks, and financial capacities of the projects and the involved stakeholders.

INDIA INFRASTRUCTURE FINANCE COMPANY LIMITED (IIFCL)

- IIFCL, established in 2006 as a **wholly-owned Government of India company**, operates under the Scheme for Financing Viable Infrastructure Projects.
- It is registered as a NBFC-ND-IFC with the Reserve Bank of India.
- **Mandate and Diversified Offerings:** IIFCL, a long-term lending institution, is diverse in eligible infrastructure sub-sectors and offerings. It **finances greenfield and brownfield projects**, covering Direct Lending, Takeout Finance, Refinance, Credit Enhancement, InVIT, and Bonds across various infrastructure sectors.
- **Cumulative Sanctions and Disbursements:** The Cumulative Sanctions and Disbursements stood at Rs. 2,13,378 Crore and Rs. 1,05,647 Crore as of March 31, 2023.

Product Offerings

- **For Greenfield Projects:**
  - **Direct Lending:** Providing long-term funds to viable projects, emphasizing Private Public Partnership.
  - **Takeout Finance:** Addressing Asset Liability Mismatch and exposure constraints for banks.
  - **Credit Enhancement:** Offering partial credit guarantee to enhance credit rating of bonds.
  - **Infrastructure Investment Trusts (InvITs):** Lending to/investing in SEBI-registered InvITs.
- **For Brownfield Projects:**
  - **Takeout Finance:** Cumulative gross sanctions of ₹ 37,495 Crore to 73 projects, disbursing ₹ 20,673 Crore.
  - **Credit Enhancement Scheme:** Providing partial credit guarantee to enhance bond credit rating.
- **For Capital Markets:**
  - **Infrastructure Project Bonds:** Investing in infrastructure project bonds to promote long-term debt markets.
- **For Institutions:**
  - **Refinance Scheme:** Providing refinance to banks and eligible financial institutions for loans to infrastructure projects.

Subsidiaries

- **IIFC (UK):** Providing financial assistance in foreign currency for the import of capital equipment.
- **IIFC Projects Ltd (IPL):** Offering advisory services for the promotion and development of infrastructure projects.
- **IIFCL Asset Management Company Ltd. (IAMCL):** Managing IIFCL Mutual Fund (IDF) assets.

Funding Sources: IIFCL raises funds from domestic and international markets, with outstanding bonds of ₹20,831 Crore from the domestic market as of September 30, 2023. Internationally, it has credit lines from institutions like ADB, World Bank, KfW, EIB, and JICA.

Rating: IIFCL's domestic long-term borrowings (bonds) have received '**AAA/AAA (CE)'** ratings from various rating agencies.

INFRASTRUCTURE DEBT FUND

- Infrastructure Debt Funds (IDFs) serve as investment vehicles directing funds into the infrastructure sector. Sponsored by commercial banks and Non-Banking Financial Companies (NBFCs) in India, these funds allow domestic and offshore institutional investors, particularly insurance and pension funds, to invest through units and bonds issued by the IDFs.
- IDFs act as refinancing vehicles for existing debt of infrastructure companies, creating room for banks to lend to new infrastructure projects, as per the Reserve Bank of India (RBI).
- There are two types of IDFs: IDF-MFs (Mutual Funds) and IDF-NBFCs (NBFCs).
  - **IDF-MFs**, regulated by SEBI, can be sponsored by banks and NBFCs.

- **IDF-NBFCs,** regulated by the RBI, can be sponsored by banks and Infrastructure Finance companies. Sponsorship involves NBFC equity participation ranging from 30% to 49% in the IDF.

- Trust-based IDFs are structured as Mutual Funds, regulated by SEBI.
- Company-based IDFs are structured as NBFCs, regulated by the RBI.

NATIONAL INVESTMENT AND MANUFACTURING ZONES (NIMZs)

- National Investment and Manufacturing Zones (NIMZs) are designated areas in India aimed at promoting **industrialization, manufacturing, and economic growth**.
- These zones are part of the Indian government's strategy to boost the manufacturing sector and attract both domestic and foreign investments.
- Key features of NIMZs include:
  - **Integrated Industrial Townships:** NIMZs are designed as integrated industrial townships with state-of-the-art infrastructure, including power, water supply, logistics, and other amenities.
  - **Multi-Sector Focus:** NIMZs typically focus on promoting manufacturing activities across multiple sectors, such as engineering, automobiles, chemicals, pharmaceuticals, textiles, and more.
  - **Incentives and Facilities:** The government provides various incentives and facilities to attract businesses to set up manufacturing units in NIMZs. This may include tax benefits, infrastructure support, and streamlined regulatory processes.
  - **Global Competitiveness:** The objective is to make these zones globally competitive by providing a conducive business environment, reducing logistics costs, and offering a cluster-based approach to industries.
  - **Employment Generation:** NIMZs aim to generate employment opportunities by attracting investments and facilitating the growth of industries, thereby contributing to economic development.
  - **Strategic Locations:** These zones are often strategically located to leverage regional strengths, connectivity, and proximity to ports or transportation hubs.
- National Investment & Manufacturing Zones (NIMZs) are one of the important instruments of National Manufacturing Policy, 2011, which seeks to transform India into a global manufacturing hub. The government encourages public and private sector participation in the development of NIMZs to create a **business-friendly ecosystem** for manufacturers.

INDUSTRIAL CORRIDORS

- Industrial corridors are planned zones that focus on promoting **industrialization, economic development, and infrastructure growth** within a specific region.

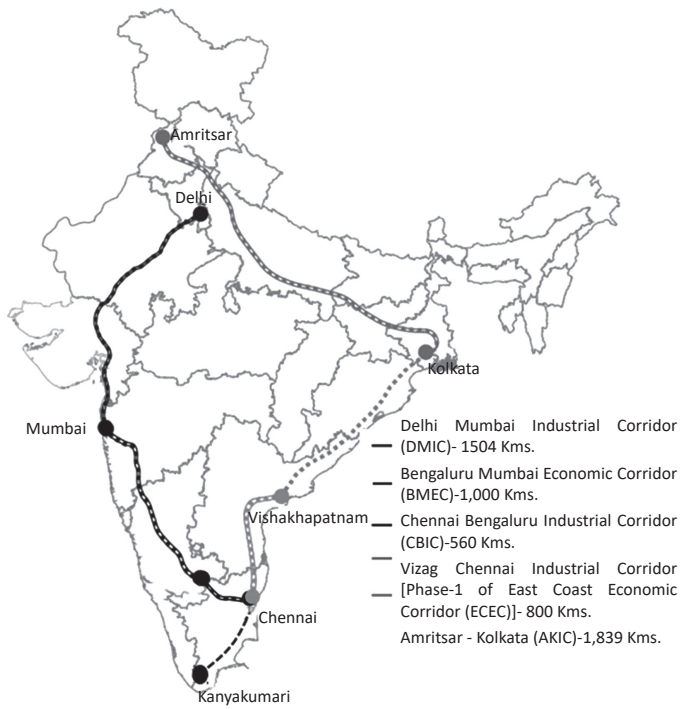


Fig. 17.3: Industrial Corridors in India

- These corridors are designed to boost manufacturing, enhance trade, and generate employment.
- Recognizing the interdependence of various economic sectors, Industrial Corridors facilitate **seamless integration** between industry and infrastructure, fostering overall economic and social development.
- Beyond immediate infrastructure development, businesses along the corridor experience long-term advantages, including **improved access** to industrial production units, reduced transportation and communication costs, enhanced delivery times, and **minimise inventory costs**.
- India has been actively developing several industrial corridors as part of its broader economic development strategy. Here are examples of industrial corridors in India:
  - **Dedicated Freight Corridors (DFCs):** These are railway corridors designed exclusively for the movement of freight. The Eastern Dedicated Freight Corridor (EDFC) and the Western Dedicated Freight Corridor (WDFC) are examples of such corridors in India.
  - **Delhi-Mumbai Industrial Corridor (DMIC):** One of the most significant industrial corridors in India, the DMIC aims to create a high-tech industrial zone spanning six states. It connects the political and financial capitals of India, i.e., Delhi and Mumbai.

- **Chennai-Bengaluru Industrial Corridor (CBIC):** The CBIC is another planned industrial corridor that aims to promote industrialization and economic development in the southern part of India, connecting major cities like Chennai and Bengaluru.
- **Visakhapatnam-Chennai Industrial Corridor (VCIC):** This corridor focuses on promoting industrial growth along the eastern coast of India, connecting the major port city of Visakhapatnam with Chennai.
- **Amritsar-Kolkata Industrial Corridor (AKIC):** Planned to connect the northern and eastern parts of India, the AKIC aims to boost economic activities and industrial development in the region.

- This initiative involves collaboration with state governments to boost industrial development.
- To streamline and integrate the development of these industrial corridors, the government is establishing the **National Industrial Corridor Development Authority (NICDA)**. These corridors are pivotal for the success of **'Make in India,'** aiming to raise the share of manufacturing in India's GDP from 16% to 25% by 2025.
- The development of 100 **Smart Cities** along these corridors is envisioned to accommodate the new workforce driving manufacturing and alleviate urban housing congestion.
- Moreover, these industrial corridors are expected to synergize with the 14 **Coastal Economic Zones (CEZs)** planned along coastal districts, ensuring comprehensive economic development across the country. The alignment of proposed industrial clusters under Sagarmala with these industrial corridors enhances their strategic significance. For instance,
  - leather clusters in Muzaffarpur and Kolkata align with the Amritsar-Kolkata Industrial Corridor (AKIC), while
  - electronic clusters in northern Maharashtra coincide with the Delhi-Mumbai Industrial Corridor (DMIC) at the JNPT node.

Key Features of Industrial Corridors

- **Infrastructure Development:** Focus on developing robust infrastructure, including transportation, logistics, and utilities, to support industrial activities.
- **Economic Zones:** Creation of special economic zones, industrial parks, and investment regions to attract businesses and investments.
- **Smart Cities:** Integration of smart city concepts to enhance the quality of life for residents and promote sustainable urban development.
- **Employment Generation:** Aims to generate employment opportunities by attracting industries and businesses to set up operations in the corridor.
- **Integrated Planning:** Comprehensive planning that considers various factors such as land use, environmental sustainability, and connectivity.

DEFENCE CORRIDOR

- Defence corridors are specialised economic zones designed to promote and facilitate the growth of the defence and aerospace industry.
- These corridors focus on creating a conducive **ecosystem for defence manufacturing, research and development, and related activities**.
- The goal is to **strengthen the defence industrial base, enhance self-reliance** in defence production, and contribute to the overall economic development of the region.

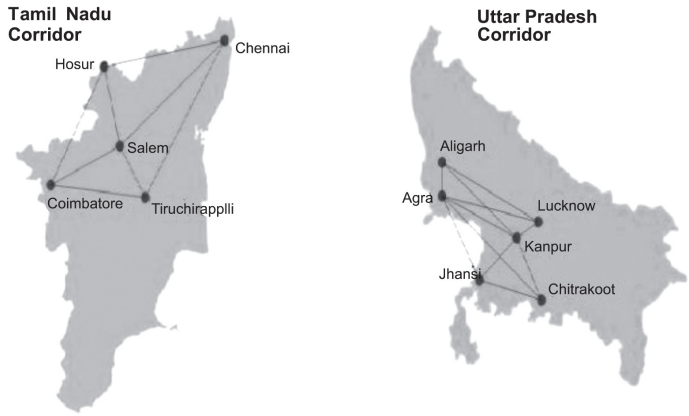


Fig. 17.4: Defence Corridors in India

- **Here are some key points about defence corridors:**
  - **Strategic Importance:** Defence corridors are strategically significant as they contribute to national security by bolstering domestic defence production capabilities. They reduce dependence on imports for critical defence equipment and technologies.
  - **Integrated Ecosystem:** These corridors aim to create an integrated ecosystem that includes defence manufacturing units, research and development centres, testing facilities, and other associated industries. The synergy among these components enhances efficiency and innovation.
  - **Public-Private Partnership (PPP):** Defence corridors often involve collaboration between the government and the private sector. Public-private partnerships play a crucial role in leveraging the strengths of both sectors to drive the growth of the defence industry.
  - **Infrastructure Development:** Special emphasis is placed on infrastructure development within defence corridors. This includes state-of-the-art industrial infrastructure, connectivity, and utilities to support the unique requirements of defence manufacturing.
  - **Skill Development:** Defence corridors focus on developing a skilled workforce with expertise in advanced manufacturing and technology. Training and skill development programs are often integrated into the corridor's initiatives to meet the specialised needs of the defence industry.

- **Technology Transfer:** The establishment of defence corridors facilitates technology transfer and collaboration between domestic and international defence manufacturers. This exchange of technology contributes to the development of indigenous capabilities.
- **Regional Economic Growth:** Defence corridors have a positive impact on the economic development of the regions in which they are located. They create **job opportunities, attract investments,** and stimulate the **growth of ancillary industries**.
- **Examples in India:** The Indian government has identified certain regions as defence corridors to promote defence **manufacturing. One such example is the** Uttar Pradesh Defence Industrial Corridor, which aims to boost defence production activities in the state. Another is **Tamil Nadu Defence Industrial Corridor**.

IGNITE YOUR MIND

Usually, communities are uprooted on a large scale leading to their displacement, wildlife is disturbed, benefits of the corridor are unequally distributed, the cultural fabric of indigenous communities are disturbed and they face health risks like respiratory problems. Do you think the cost of Industrial corridors outlives the benefits? How can the government harmonise industrial growth with minimum social impact?

INDUSTRIAL PARKS

India has numerous industrial parks that play a vital role in supporting industrial activities, promoting economic growth, and attracting investments. These industrial parks are spread across the country and cater to various sectors, including manufacturing, technology, and services. Here are some prominent industrial parks in India:

Name	Location	Specialisation
Sri City, Andhra Pradesh	Chittoor District, Andhra Pradesh	Multi-sectoral industrial park with a focus on electronics, automotive, textiles, and engineering.
Manesar Industrial Area, Haryana	Gurgaon, Haryana	Automotive and ancillary industries, manufacturing, and IT.
SIPCOT Industrial Complex, Tamil Nadu	Various locations in Tamil Nadu (e.g., Chennai, Coimbatore, Hosur)	Diverse industries, including automotive, textiles, IT, and electronics.
Rajiv Gandhi Chandigarh Technology Park, Punjab	Chandigarh, Punjab	IT and technology-related industries.
Noida Special Economic Zone (NSEZ), Uttar Pradesh	Noida, Uttar Pradesh	IT, software development, and other technology-driven industries.
MIDC Industrial Area, Maharashtra	Various locations in Maharashtra (e.g., Pune, Mumbai, Nashik)	Diverse industries, including manufacturing, automotive, pharmaceuticals, and IT.
Infopark, Kerala	Kochi, Kerala	IT and software development.
Vikram Udyogpuri, Madhya Pradesh	Ujjain, Madhya Pradesh	Manufacturing and processing industries.
Adani Ports and SEZ, Gujarat	Mundra, Gujarat	Port-based industries, logistics, and trade.
Hinjewadi IT Park, Maharashtra	Pune, Maharashtra	IT and software development.
Visakhapatnam Special Economic Zone (VSEZ), Andhra Pradesh	Visakhapatnam, Andhra Pradesh	Multi-sectoral economic zone with a focus on exports.
Electronics City, Karnataka	Bangalore, Karnataka	Electronics and IT industries.
Gummidipoondi SIPCOT Industrial Park, Tamil Nadu	Gummidipoondi, Tamil Nadu	Diverse industries, including chemicals, textiles, and manufacturing.
MWC Jaipur (Mahindra World City), Rajasthan	Jaipur, Rajasthan	Multi-sectoral economic zone with a focus on manufacturing, SEZs, and residential areas.
Kalinganagar Industrial Complex, Odisha	Kalinganagar, Odisha	Steel and metal industries.

These are just a few examples, and there are many more industrial parks and zones across India, each contributing to the country's industrial and economic development. These parks often offer infrastructure, facilities, and incentives to attract businesses and facilitate their operations.

Global Infrastructure Outlook (GIO)

- Global Infrastructure Outlook (GIO) is a G20 initiative that forecasts infrastructure investment needs an d gaps across 56 countries, including India, in seven sectors—road, rail, airports, ports, telecom, energy, and water until 2040.
- Developed by the Global Infrastructure Hub and Oxford Economics, it reveals a global infrastructure investment trend of $79 trillion, with a required investment of $94 trillion, resulting in a $15 trillion global investment gap.
- Electricity and roads constitute over two-thirds of global investment needs.
- In Asia, the infrastructure investment gap is 10%, with China contributing nearly 30% of global infrastructure investment.
- In Asia, India, the second-largest infrastructure market after China.

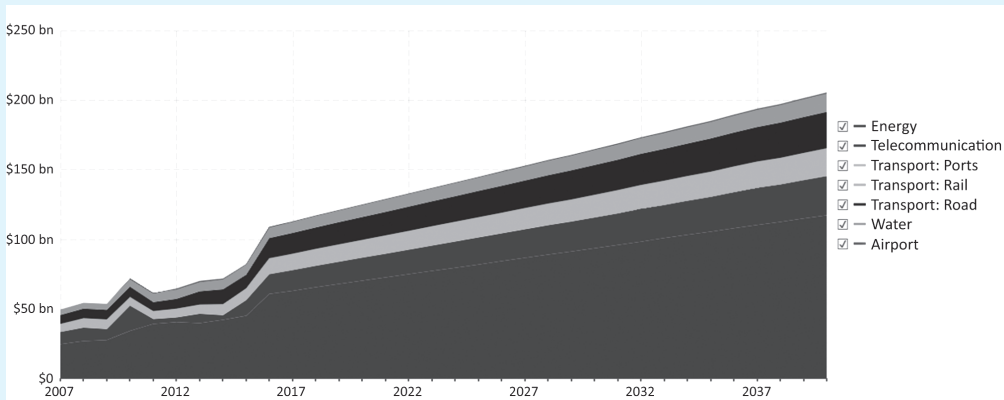


Fig. 17.5: Infrastructure Investment at current trends for each sector

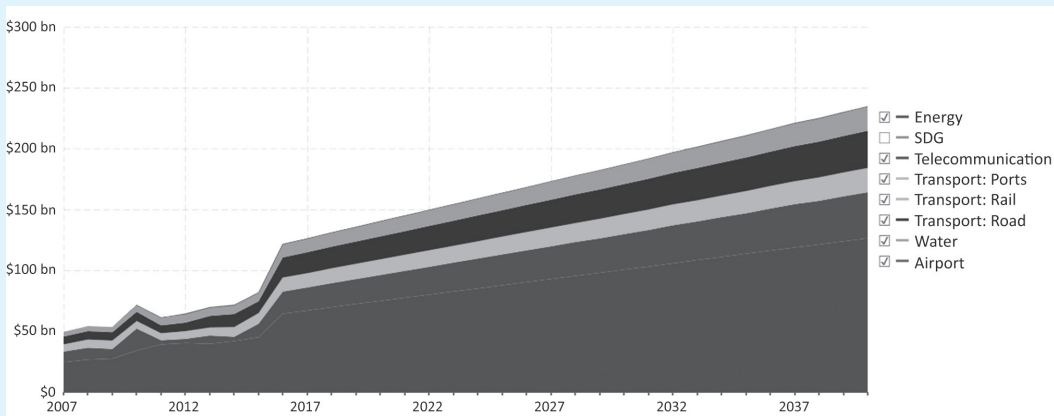


Fig. 17.6: Infrastructure Investment need for each sector

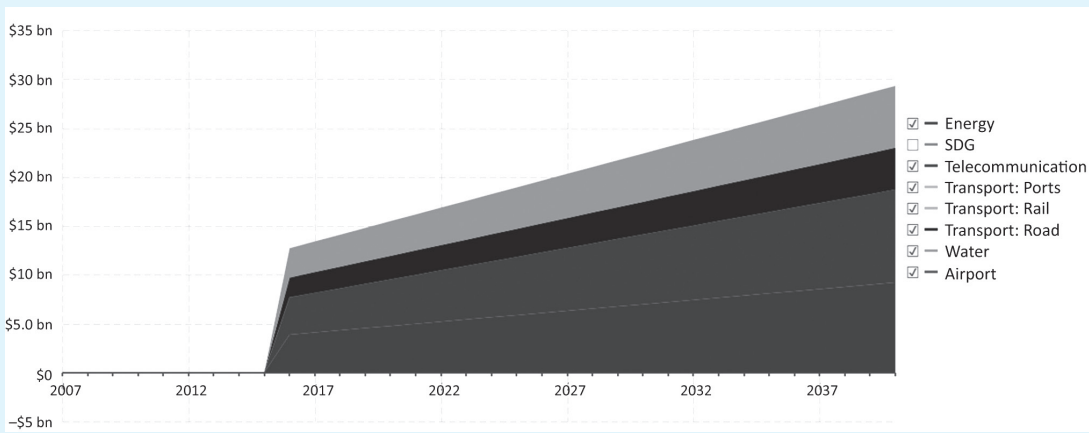


Fig. 17.7: Infrastructure Investment Gap for each sector

ROAD SECTOR

- Road Transport comprises **87% of passenger traffic and 60% of freight traffic** in India.
- The country has a road network of approximately 63.73 lakh km, making it the **second-largest** globally after the United States.
- In terms of road density (length of road per square kilometer), India surpasses major countries like the United States, the United Kingdom, and China.

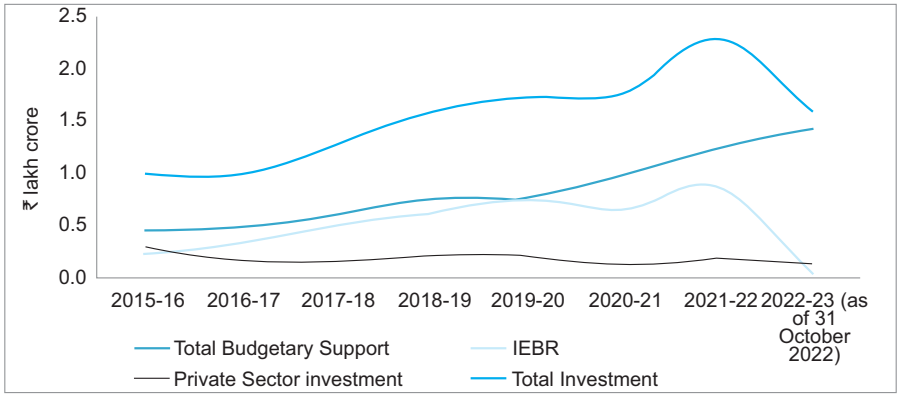


Fig. 17.8

- The Ministry of Road Transport and Highways oversees National Highways, which include expressways.
- State Governments, through state Public Works Departments, finance and manage State Highways.
- **Maharashtra boasts the longest length of both National Highways and State Highways** among States/UTs.

Road Projects in India Follow Three Main Models

- **Engineering Procurement and Construction (EPC):** The government awards contracts to private contractors based on the lowest cost tender. The private party builds the road and hands it over to the government for maintenance. (Not a PPP model)
- **BOT-Toll (Build Operate Transfer):** The private party is chosen to build, maintain, and operate the road, with revenue generated through toll collection. If toll revenue is insufficient to cover costs, the government provides Viability Gap Funding (VGF). All traffic and commercial risks lie with the private party. (A PPP model)
- **BOT Annuity (Build Operate Transfer):** The private party is selected based on the lowest annual payment tender for building, maintaining, and operating the road. The government pays the private party, recovering all construction and maintenance costs. Toll collection rights belong to the government, and toll collection may or may not occur. (A PPP model)

Due to drawbacks in the annuity model, the government introduced a fourth model in January 2016:

- **Hybrid Annuity Model:** A blend of Annuity and EPC models. The government pays 40% of the bid project cost during construction, linked to project progress, and the remaining 60% annually to the bidder with the lowest annual payment after completion. The private partner bears construction and maintenance risks, with only partial financing risk. (A PPP model) NHAI has adopted the **TOT (Toll Operate Transfer) model** for already constructed EPC road projects.
- Under TOT, private companies take over operational projects on a long-term lease, paying upfront amounts to NHAI. NHAI utilises these funds for new highway construction. (A PPP model)

The Delhi-Noida Direct (DND) Flyway is an early PPP project based on the **Build Own Operate Transfer (BOOT) model,** operational since 2001.

Notable Points From The 2023-24 Budget and The Road Sector

- The Ministry of Road Transport and Highways receives a substantial boost with a 25% increase in allocation, reaching ₹ 2,70,435 crore in the Union Budget 2024.
- The **Pradhan Mantri PVTG Development** Mission will extend road connectivity to Particularly Vulnerable Tribal Groups (PVTGs).
- The **PM Gati Shakti program,** emphasizing synchronized planning among Ministries and States for infrastructure development, stands out as one of the four fundamental pillars of the Budget.

National Highways Development Project (NHDP)-Bharatmala Pariyojana

NHAI: NHAI, established under the NHAI Act, 1988, operates under the Ministry of Road Transport and Highways. Tasked with the National Highways Development Project and other smaller initiatives, NHAI plays a key role in the development, maintenance, and management of national highways.

NHDP: The National Highways Development Project (NHDP) was a significant initiative launched by the Government of India to upgrade and expand the road network across the country. The project aimed to improve infrastructure, enhance connectivity, and promote economic development. NHDP was launched in 1998 and underwent several phases with specific objectives and focus areas. Here are the main phases of the NHDP:

- **NHDP Phase I:**
  - **Objective:** The initial phase focused on the development of high-traffic corridors and the **Golden**

Quadrilateral (GQ), connecting the major metropolitan cities of Delhi, Mumbai, Chennai, and Kolkata.

- **Implementation:** Launched in 1998, the GQ project was one of the largest infrastructure projects globally. It involved the construction and upgrade of approximately 5,846 kilometers of highways.

❑ **NHDP Phase II:**

- **Objective:** The second phase aimed to improve **North-South and East-West connectivity** by developing four-lane highways and expanding the road network.
- **Implementation:** Launched in 2003, Phase II included projects such as the North-South and East-West Corridors, focusing on efficient transportation between various regions.

❑ **NHDP Phase III:**

- **Objective:** The third phase aimed at upgrading and expanding selected stretches of national highways to four or six lanes.
- **Implementation:** Launched in 2005, this phase included the development of 12,109 kilometers of highways and improvement of existing infrastructure.

❑ **NHDP Phase IV:**

- **Objective:** The fourth phase focused on the development of expressways, including the Vadodara-Mumbai Expressway, Delhi-Jaipur Expressway, and other high-priority projects.
- **Implementation:** Launched in 2009, Phase IV aimed to enhance connectivity and reduce travel time on key routes.

❑ **NHDP Phase V:**

- **Objective:** The fifth phase aimed to improve connectivity in the northeastern region and border areas.
- **Implementation:** Launched in 2009, Phase V included projects to enhance infrastructure in strategic areas, focusing on national security and economic development.

❑ **NHDP Phase VI:**

- **Objective:** The sixth phase aimed at expanding the road network through the development of national and state highways.
- **Implementation:** Launched in 2017, Phase VI included various projects to upgrade and widen existing highways, promoting regional connectivity.

Bharatmala Pariyojana: The Bharatmala Pariyojana, launched in 2015, by the Government of India, is a comprehensive highways development programme aimed at optimizing road traffic efficiency and bridging infrastructure gaps across the country. The project covers 34,800 km of roads and is funded through a combination of cess on petrol and diesel, toll tax, and government budgetary support.

❑ **Components of Bharatmala Pariyojana**

- Development of Economic Corridors: 9,000 km
- Inter-corridor & Feeder Roads: 6,000 km
- Improving National Corridors: 5,000 km
- Border & International Connectivity Roads: 2,000 km
- Coastal & Port Connectivity Roads: 2,000 km
- Expressways: 800 km
- Balance of NHDP Works: 10,000 km

❑ **Key Features**

- Decongesting national corridors through elevated corridors, bypasses, and logistics parks.
- Construction of strategic Border Roads and International Connectivity roads.
- Development of 26,200 km of Economic Corridors with a focus on seamless travel and uniform standards.
- Technical, financial, and economic appraisal of projects by an empowered committee.

❑ **Objectives**

- Optimize the efficiency of goods and people movement.
- Generate direct and indirect employment opportunities.
- Connect 550 districts through National Highway linkages.

❑ **Highlights**

- Focus on multimodal logistics parks, elimination of choke points, and leveraging inland waterways.
- Enhances connectivity in the North East with the North East Economic corridor.
- Emphasis on technology and scientific planning for project execution.
- Seamless connectivity with neighboring countries through integrated check posts.

❑ **Challenges**

- Project completion delayed beyond the initial 2022 target.
- Increased land costs and budget estimates.
- Government exploring additional investments from market funds, private sources, foreign debts, and bond markets.

❑ **Bharatmala Route**

- Resource mobilization through market borrowings, Central Road Fund, monetizing government-owned road assets, and budgetary allocation.
- Economic growth focus by increasing corridors from 6 to 50.
- Aims to improve trade, enhance national highways, and expand the road network in India.

Other Government Measures Undertaken to improve Road Transport

❑ **Setu Bharatam,** initiated in 2016, sought to eliminate all railway crossings on national highways by 2019. The scheme included a strategy for substituting level crossings with railway over bridges (ROBs) or road under bridges (RUBs).

- **Chardham Mahamarg Vikas Pariyojna,** launched in 2016, endeavors to enhance 889 km of national highways (with a minimum width of 10 m) at an estimated cost of ₹ 12,000 crore. This development facilitates convenient access to the four prominent Dhams, namely, Gangotri, Yamunotri, Kedarnath, and Badrinath, located in Uttarakhand.
- The **'Special Accelerated Road Development Programme'** targets the northeastern region.
- The **Logistics Efficiency Enhancement Programme (LEEP)** aims to elevate multimodal transport in India by establishing multimodal logistics parks.

Motor Vehicles (Amendment) Act, 2019

This amendment overhauled the Motor Vehicles Act of 1988 with the following key modifications:

- The revised act introduces escalated penalties for various traffic-related offenses, with an **annual 10% increment in motor vehicle penalties**, serving as a potential deterrent.
- **New penalties,** including those for oversized vehicles, failure to yield to emergency vehicles, offenses by juveniles, etc., have been incorporated.
- Minimum **compensation for hit-and-run cases** has been significantly increased: from ₹ 25,000 to ₹ 2,00,000 in cases of death and from ₹ 12,500 to ₹ 50,000 in cases of grievous injury.
- The amended bill grants the central government authority to **recall defective motor vehicles** that pose risks to the environment, drivers, or other road users.
- A **National Road Safety Board**, established by the central government, will provide counsel to both central and state governments on road safety and traffic management.
- The act introduces a scheme for **cashless treatment of road accident victims** during the golden hour.
- The central government is mandated to establish a **Motor Vehicle Accident Fund** to ensure mandatory insurance coverage for all road users in India.

IGNITE YOUR MIND

According to data published by Ministry of Road, Transport and Highways, India records, on an average, 1.5 lakh deaths due to road accidents per year. Why does the frequency of road accidents remain alarmingly high in India? Think of some comprehensive measures that could be taken to transform our roads into safer avenues for all.

PM GATI SHAKTI

Gati Shakti is the **National Master Plan for infrastructure development and multi-modal connectivity,** marking a significant shift in development planning.

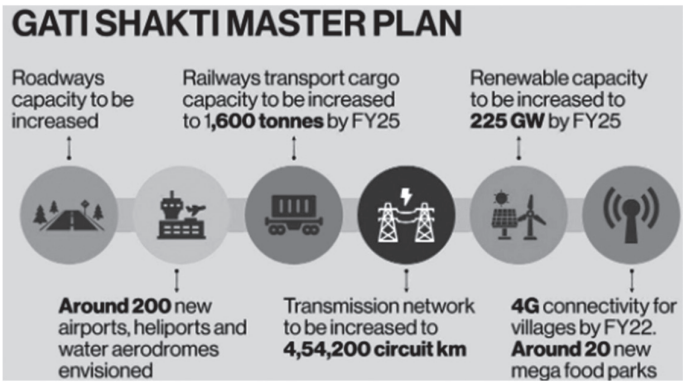

GATI SHAKTI MASTER PLAN
Roadways capacity to be increased
Railways transport cargo capacity to be increased to 1,600 tonnes by FY25
Renewable capacity to be increased to 225 GW by FY25
Around 200 new airports, heliports and water aerodromes envisioned
Transmission network to be increased to 4,54,200 circuit km
4G connectivity for villages by FY22. Around 20 new mega food parks

Fig. 17.9: Gati Shakti Master Plan

Key Points

- **Digital Platform:** Gati Shakti serves as a digital platform fostering integrated planning and coordinated implementation of infrastructure connectivity projects across various ministries, including Railways and Roadways.
- **Incorporation of Schemes:** It integrates infrastructure schemes from different Ministries and State Governments, covering areas such as Bharatmala, Sagarmala, inland waterways, dry/land ports, UDAN, and economic zones like textile clusters, pharmaceutical clusters, etc.
- **Geospatial Data:** The portal provides 200 layers of geospatial data, including information on existing infrastructure, forests, rivers, district boundaries, and satellite imagery for project monitoring.
- **Real-time Tracking:** Gati Shakti enables real-time tracking of projects, facilitating inter-ministerial cooperation and providing critical data for comprehensive planning and execution.
- **Project Monitoring Group:** A project monitoring group under the DPHT (Development, Project, and Handholding Team) ensures real-time progress monitoring, resolving inter-ministerial issues promptly.
- **Reduced Human Intervention:** The portal minimizes human intervention by maintaining constant communication between ministries, enabling quicker decision-making and review of projects.
- **Clearance Highlighting:** It highlights all required clearances for new projects based on their location, allowing stakeholders to apply for these clearances directly on the portal.
- **Coordination Benefits:** Gati Shakti promotes coordination between ministries, leading to optimal resource utilization. For instance, it allows for the creation of a single tunnel serving both road and railway purposes.
- **Leveraging Technology:** The plan utilizes technology extensively, incorporating spatial planning tools with ISRO imagery to generate a real-time dashboard.

- **Cost Reduction:** Gati Shakti aims to address the lack of coordination and advance information, reducing logistics costs from 13% of GDP to enhance India's competitiveness in exports.

Benefits

- **Enhanced Logistics Efficiency:** Reduces travel times and costs, benefiting businesses and consumers.
- **Boosted Economic Growth:** Attracts investments, estimates 1-2% GDP growth potential.
- **Job Creation:** Generates millions of jobs in various sectors.
- **Export Competitiveness:** Enhances global competitiveness of Indian exports.
- **Regional Development:** Connects regions, addressing disparities.

Challenges

- **Implementation Hurdles:** Project management efficiency and land acquisition challenges.
- **Financing Needs:** Requires significant public-private investments.
- **Digital Transformation:** Bridging the digital divide and tech infrastructure.
- **Environmental Sustainability:** Balancing development with environmental concerns.
- **Social Impact:** Addressing land acquisition and ensuring equitable benefits.

Way Forward

- **Efficient Project Management:** Unified platform for planning and monitoring projects.
- **Public-Private Partnerships:** Innovative financing models for private sector involvement.
- **Skilling and Capacity Building:** Developing a skilled workforce for diverse operations.
- **Environmental Considerations:** Integrating sustainability and clean technologies.
- **Community Engagement:** Proactive consultation and equitable benefits for locals.

PM Gati Shakti has transformative potential, requiring effective solutions for challenges to ensure inclusive development and economic prosperity.

RAILWAYS

Engine of Future Economic Growth

- Since its inception, the Indian Railways has been crucial for integrating markets and fostering a modern economy.
- It links industrial centers, facilitates bulk transportation in the energy sector, and acts as a key transportation **backbone for goods and people** across the country.
- Contributing around **1% to India's National Income**, it plays a vital role in economic development, employing **6% of the organized sector workforce** and an additional 2.5% indirectly.
- Despite its historical significance, the Indian Railways faces challenges such as **capacity constraints, congestion, poor services, and financial issues,** leading to a decline in its GDP share to around 1%.
    - However, massive investments to enhance connectivity could potentially boost economic growth by 2-3%.

Rail Route to Higher Growth

- Investing in public infrastructure, such as railways, contributes to economic growth through dual mechanisms:
    - **Short-term Impact:** It stimulates aggregate demand and attracts private investment due to the complementary nature of infrastructure services.
    - **Long-term Effect:** It generates a supply-side impact as the built infrastructure enhances the productive capacity of the economy over time.
- Railways exhibit strong backward linkages, requiring inputs like iron, steel, and engineering, leading to the development of associated industries. Increasing railway **investment by ₹ 1 results in a ₹ 3.3 output** increase, with a notable impact on the manufacturing sector, aligning with the **"Make in India"** initiative.
- Moreover, railways contribute to **forward linkages** as their services are integral inputs to various sectors like power plants and tourism. A ₹ 1 investment in railways boosts the output of other sectors by approximately ₹ 2.5. The decline in forward linkage effect over time is attributed to capacity constraints, necessitating reliance on alternative modes of transport, primarily roads.
- The **cumulative impact of forward and backward linkages** indicates a substantial multiplier effect (over 5) of railway investment. A ₹ 1 increase in railway investment translates to a ₹ 5 increase in economy-wide output (GDP).
- Rail transportation offers several advantages over road transport, being six times more **energy-efficient** and three times more **economical**. Additionally, the social costs related to environmental damage are significantly lower in the case of rail transport.

100% Foreign Investment

- Foreign investment in railways, up to 100%, is permitted through the automatic route, specifically for railway infrastructure. However, this **does not extend to train operations and safety.**
- Given the capital-intensive nature of the railways sector, substantial funds are essential for development. The sector's growth is heavily **reliant on the availability of funds** for investment in rail infrastructure.

- Presently, internal revenue sources, primarily generated profits from Indian railways and government funding through the budget fall short of meeting the capital requirements of the financially strained rail sector.
- A heightened foreign investment cap of **100% in the construction and maintenance** of rail infrastructure would address this shortfall, providing the necessary capital for the congested rail network.

Bibek Debroy Committee's Report on Railway Reforms

- The Bibek Debroy Committee has proposed a significant reform for the Indian Railways, dividing it into two entities:
  - the **Railway Infrastructure Corporation (RIC)** and
  - **Indian Railway Trains (IRT)**
- In this restructuring, Indian Railway Trains (IRTS) for public service will coexist with private trains on RIC infrastructure.
- A **"Regulatory Body"** is introduced to oversee fair competition, including track access, between government (IRTS) and private trains.
- The Railway Ministry sets broad policies, and the regulatory body enforces competition principles. The existing Railway Board will transform into a corporate Board exclusively for the IRTS.
- According to the **Economic Survey 2019-20**, the transport sector contributed 4.77% to Gross Value Addition (GVA) in 2017-18, with road transport leading at 3.06%, followed by Railways (0.75%), air transport (0.15%), and water transport (0.06%).
- Private participation in the railway sector through Public-Private Partnership (PPP) mode is encouraged by the Government of India under the **"New India New Railway"** initiative.

Advancing High-Speed Rail (HSR)/ Bullet Trains in India: Opportunities and Criticisms

- Presently, Indian Railways (IR) operates 12,617 passenger and 7,421 freight trains daily on a 65,436 km network.
  - The average speed of Mail and Express trains is just 51.1 km/h, while freight trains run at an average of 28 km/h. Most main train routes operate at over 100% capacity, leading to delays and accidents. IR is currently highly constrained by capacity, not demand.
- Per capita mobility in India is lower than in most developed countries and driven by population growth, GDP, income levels, and urbanization, intercity passenger travel demand is expected to rise significantly in the coming years.

High-Speed Rail (HSR) System

- The HSR System includes infrastructure, rolling stock (locomotives, wagons) and operating conditions.
- Globally, high-speed trains vary in technology, infrastructure, rolling stock, and achievable speeds, ranging from 200 kmph to 350 kmph.
- The Ministry of Railways, Govt. of India, plans to build HSR corridors such as the **Golden Quadrilateral, Delhi-Chandigarh-Amritsar, Delhi-Chennai, Chennai-Bangalore-Mysore, and Mumbai-Ahmedabad**.
- The **Indian Railways' vision 2020** aims for a two-pronged approach, **increasing speeds** on existing corridors and building new advanced **HSR corridors**.

Advantages of HSR

- **Time efficiency** for distances below 800 km compared to air travel.
- Multiple benefits, including city revitalization, high-density real estate development, economic growth in smaller cities, employment access, and enhanced tourism.
- **Environmentally friendly** with electrified railways and minimal environmental damage.
- **Opportunity for domestic manufacturing** capacity, promoting innovation, technology transfer, and supporting industries like steel.
- HSR fosters regional economic development by enhancing connectivity among large urban centers and smaller cities along the corridors. This generates **socio-economic benefits**, improving access to employment, health, education, and time savings.
- HSR's ability to link small and medium cities promotes a more **geographically balanced development** compared to air transport, benefiting only a select few cities.

Criticism

- HSR trains operate at a loss globally despite higher ticket prices than air travel, raising concerns about financial viability.
- Some experts argue for improving existing tracks to run trains at around 200 kmph, questioning the necessity of HSR given budget constraints and the need for overall railway infrastructure upgrades.

Way Forward

- India, with the **world's fourth-largest rail network**, is justifying its first High-Speed Rail (HSR) line for technological advancements. This initiative is framed as a nation-building effort, not merely a project responding to transport demand. Recognizing global progress is crucial.
- Although upfront HSR investments are significant, their sustainability benefits unfold gradually. Holistic evaluation of **long-term developmental advantages** is essential.

IGNITE YOUR MIND

The Bullet Train Project in India, is one of the most contested railway projects in India. Sceptics argue that this service puts a huge financial burden on Indian Finances. Do you agree, given that, India is still a developing country that faces a financial crunch in the most basic human development sector the opportunity cost of BTP is too high, and this money should be rather used for modernizing existing railway network, education or health?

- Given the demand for intercity transport and rising incomes, India's transition in **intercity transport** is supported by numerous high-density corridors.

Dedicated Freight Corridors (DFCs)

- Dedicated Freight Corridors (DFCs) represent the most extensive rail infrastructure project in independent India. The Ministry of Railways has established the **"Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL),"** a 100% subsidiary functioning as a **Special Purpose Vehicle (SPV)** for planning, development, financial resource mobilization, and construction, maintenance, and operation of the Eastern and Western DFCs. Key features include:
  - DFCCIL will **own and operate** the assets, with the Ministry of Railways running trains on these tracks and paying access charges to DFCCIL.
  - **Centralized control** of operations on the DFC, enabling the running of double-stacked containers along these corridors.

Eastern Corridor

- **Ludhiana - Mugalsarai - Sonnagar - Kolkata (1835 Km)**
  - (Ludhiana - Mugalsarai section debt funding by World Bank; Mugalsarai - Sonnagar section funded by Ministry of Railway; Sonnagar - Kolkata section through PPP Model)

Western Corridor

- **Delhi - Rewari - Vadodara - Mumbai (1483 Km)** (funded by Japan)
  - Anticipated operation and maintenance cost on DFC is expected to be half compared to the present Indian Railways (IR) network.
  - DFCCIL will run freight trains at a maximum speed of 100 km/h, an improvement over the current maximum speed of 75 km/h on Indian Railway tracks, with the average speed of freight trains increasing from 26 km/h on IR lines to 70 km/h on DFC.
  - Shifting 70% of goods trains from IR tracks to DFC to decongest existing tracks for more passenger trains.
  - **Multimodal logistics parks** planned along the corridors to offer complete transport solutions.
  - Some sections of the Eastern and Western DFC are operational, with the full length expected to be operational by 2023.

Regarding the PPP (Investment/Business Model) in Dedicated Freight Corridor

- On a PPP model, the Indian Railway (IR) handles clearances and land acquisition, while the private player is responsible for design, construction, and maintenance of the track.
- Freight collection is managed by IR, with 50% of the freight revenue from that section allocated to the private party, selected through a tendering process.
- If the 50% freight revenue is insufficient to cover construction and maintenance costs, the private party may seek **Viability Gap Funding (VGF)** from IR.

Railway Platform Modernization

- Indian Railways has embraced three models for station redevelopment:
  - The first is the **Public Private Partnership (PPP) model**, where a project is meticulously planned, statutory clearances are obtained, and a developer is selected to enhance a facility. Habibganj, located in the suburbs of Bhopal, stands as the country's inaugural railway station redeveloped under the PPP project.
  - The second model involves **collaboration with foreign governments** to develop stations.
  - The third model is the **Swiss Challenge method**, granting bidders the freedom to independently design and develop a project. The company whose project plan is accepted is then given the opportunity to work on the project at the price quoted by the lowest bidder. If the company declines, the project is awarded to the lowest bidder.

In September 2022, the Government of India approved the redevelopment of three railway stations—Mumbai, New Delhi, and Ahmedabad—under the **Engineering Procurement and Construction (EPC) Model**. Originally planned as a PPP (BOT) model, the government has now opted for the EPC Model.

Rail Development Authority (RDA)

- In April 2017, the government initiated a significant reform in the railways by approving the establishment of the Rail Development Authority (RDA), which will serve as the **regulator for the railway sector**.
- The envisioned structure of the RDA includes a **Chairman and three other Members** who will provide recommendations to the government for consideration and decision-making.

- Operating within the framework of the Railway Act 1989, the RDA will undertake various functions, including recommending tariffs, framing principles for social service obligations, and providing guidelines for track access charges.
- It will ensure fair play and a level playing field for stakeholder investment, offer suggestions for policies on private investment, safeguard investors, and resolve disputes related to future concession agreements.

Why RDA?

- The establishment of the RDA addresses the longstanding need for an independent regulatory mechanism for the orderly development of infrastructure, ensuring competition, and safeguarding customer interests.
- Over the years, the absence of a regulatory authority led to challenges, particularly with railway ministers hesitating to raise passenger fares, resulting in freight revenue subsidizing passenger traffic and imposing additional costs on the industry.
- The RDA aims to mitigate this by providing an independent body that can recommend fare and freight rate revisions without succumbing to political pressures.

- Additionally, the RDA will **set efficiency and performance standards**, propose measures for the adoption of new technologies and human resource development, disseminate information, benchmark service standards against international norms, and ensure global best practices.
- It will also establish a framework for non-discriminatory open access to dedicated freight corridor infrastructure and monitor public-private partnership policies.

Role

- **Government Decision-Making Support**
  - Informed decisions on policy and operational matters
  - Aligning service pricing with operational costs
- **Non-Fare Revenue Enhancement**
  - Proposing measures for boosting non-fare revenue
  - Strategies to diversify revenue streams
- **Consumer Interest Protection**
  - Safeguarding the interests of railway consumers
  - Ensuring fair and reasonable service standards
- **Competition Promotion**
  - Encouraging healthy competition in the railway sector
  - Measures to enhance market dynamics
- **Market Development Initiatives**
  - Promoting the development of the railway market
  - Creating an environment conducive to growth
- **Investment-Friendly Atmosphere**
  - Fostering a positive climate for railway investments
  - Policies to attract private and public investments
- **Efficient Resource Allocation**
  - Ensuring optimal utilization of resources
  - Strategies for effective resource management
- **Transparency in Tariff Determination**
  - Establishing transparency in passenger and freight tariffs
  - Communicating tariff decisions to the public
- **Consumer-Centric Quality Service**
  - Focus on delivering quality service to railway users
  - Continuous improvement in service standards
- **Cost Optimization Strategies**
  - Implementing measures to optimize operational costs
  - Ensuring cost-effective railway services

SPECIAL ECONOMIC ZONES (SEZ)

- A Special Economic Zone (SEZ) is a designated **duty-free enclave** within a country, treated as foreign territory for trade operations, duties, and tariffs.
- Established by the **SEZ Act of 2005**, effective from February 2006, the key objectives include generating economic activity, promoting exports, attracting domestic and foreign investment, creating employment opportunities, and developing infrastructure.
- The SEZ Rules outline the following provisions:
  - **Streamlined procedures** for the development, operation, and maintenance of the SEZ, including setting up units and conducting business within the SEZ.
  - Single-window clearance for establishing an SEZ.
  - Single-window clearance for setting up a unit within a Special Economic Zone.
  - Single-window clearance for matters pertaining to both Central and State Governments.
  - **Simplified compliance procedures and documentation** with a focus on self-certification.
- Private, foreign entities and Central and State Governments or their agencies can establish SEZs in India
- Goods and services entering the SEZ from the Domestic Tariff Area (DTA) are treated as exports, while those leaving the SEZ for DTA are considered imports. SEZ units must be positive Net Foreign Exchange Earners, calculated cumulatively for five years from production commencement.
- Incentives for SEZ units include 100% income tax exemption on export income for the first 5 years, 50% for the next 5 years, and 50% of ploughed back export profit for the subsequent 5 years. Single-window clearance, duty-free import/procurement, and zero-rated supplies under GST for SEZs are additional benefits.
- **Challenges:** India's experience with Special Economic Zones (SEZs) has been disheartening thus far. The **Comptroller and Auditor General (CAG)**, in its report

on SEZs, emphasized the significant shortcomings in achieving the intended socio-economic objectives across all sectors of SEZs. Urgent government intervention is needed to address the factors hindering the growth of non-operational and underperforming zones. The challenges faced by SEZs include:

- Underutilized land in SEZs and a **lack of flexibility** in utilizing the land for different sectors.
- Existence of **multiple models of economic zones**, such as SEZ, Coastal Economic Zone, Delhi-Mumbai Industrial Corridor, National Investment and Manufacturing Zone, Food Parks, and Textile Parks.
- **Disadvantage in domestic sales of SEZs** due to the obligation to pay full customs duty, unlike the lower rates with ASEAN countries under the Free Trade Agreement.

In the budget for 2022-23, the government announced replacing "The Special Economic Zones Act" with new legislation, enabling states to participate in the 'Development of Enterprise and Service Hubs (DESH)'.

- Requirement for domestic firms to pay in foreign exchange for services provided by a SEZ unit, though this norm does not apply to the sale of goods, where payments can be made in rupees.
- Government's **inconsistent policy** on various tax exemptions for SEZs.

WATER TRANSPORT

- The Ministry of Shipping, Government of India, oversees policies and initiatives pertaining to both inland water transport and sea transport.

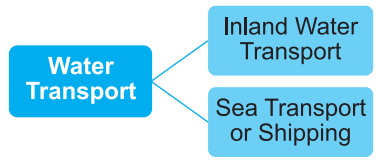


Fig. 17.10: Water Transport

Inland Water Transport

- India boasts one of the most extensive navigable inland water networks globally.
- Presently, the transport of cargo through these inland waterways (IWs) constitutes less than 1% of the overall cargo movement.
- The regulation of navigation in inland waterways falls under the purview of the **Inland Waterways Authority of India (IWAI)**.

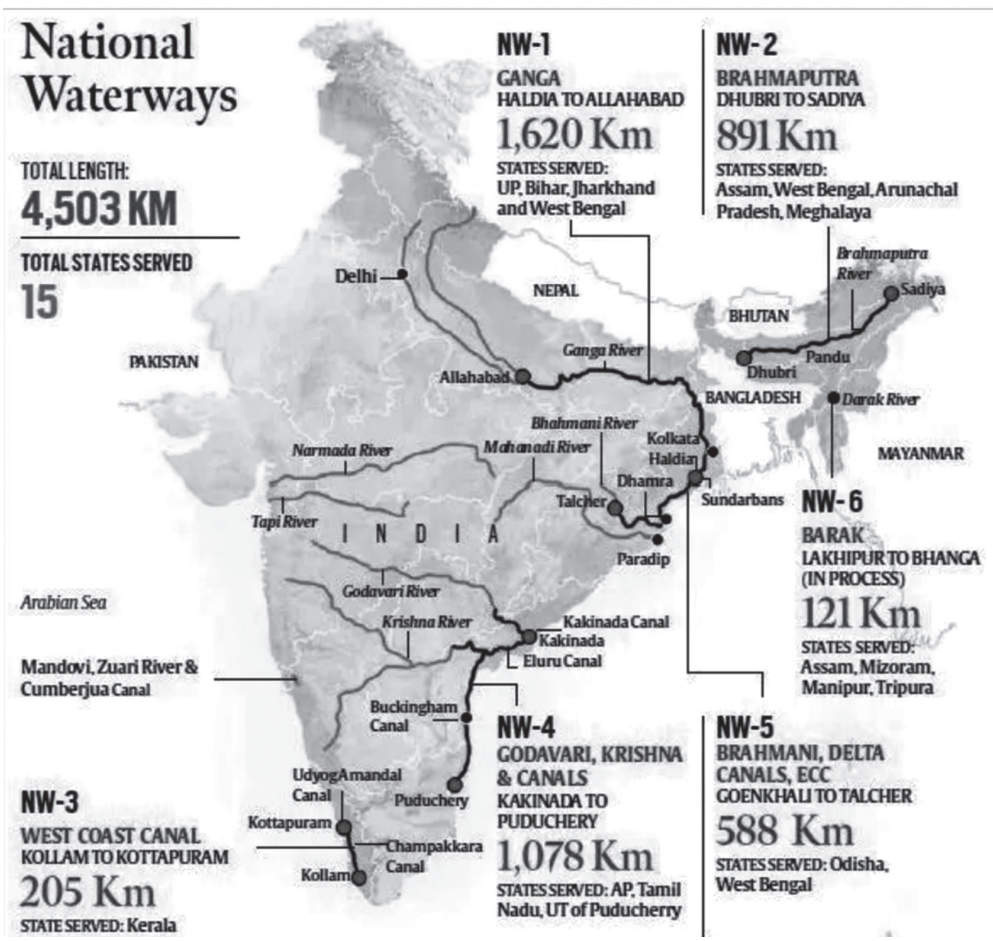


Fig. 17.11: National Waterways in India

Recent Initiatives

- In 2016, the government declared 106 additional National Waterways (NWs) under the National Waterways Act, 2016, bringing the total to 111, with three currently operational. The largest, NW 1, covers the 1620 km Prayagraj-Haldia stretch, while the smallest, NW 69, is a 5 km stretch along the Manimuthar River in Tamil Nadu.
- The Jal Marg Vikas Project on NW 1, aimed at enhancing navigation capacity from Varanasi to Haldia (1380 km), began in 2017 and is slated for completion by 2022-23 with World Bank support.
- Additionally, a permanent Ro-Ro cum IWT terminal has been built at Dhubri in NW 2, and dredging work is underway in a section of NW 4.
- Among the 106 new NWs, 20 are deemed technically viable, with development activities initiated in 10 of them.

Inland Vessels Act, 2021

The Inland Vessels Act of 1917, having undergone multiple amendments, featured provisions governing the restricted movement of mechanically propelled vessels, leading to non-uniform standards and regulations across various states.

The Inland Vessels Act 2021, replacing its predecessor, aims to standardize the application of laws pertaining to inland waterways and navigation nationwide. Key provisions include

- The ability of **state governments to declare inland water areas as "Zones,"** certification requirements for mechanically propelled vessels indicating the operational zone,
- Maintenance of a **central database**,
- Central Government-prescribed standards for qualifications, training, examination, and the issuance of competency certificates.
- The Act also sets **standards for preventing environmental pollution** and
- Mandates the establishment of a **Development Fund** by state governments for emergency preparedness, pollution containment, wreck removal, and promoting inland water navigation development.

The new legislation seeks to ensure consistent rules across states, facilitating unimpeded and secure vessel movement and encouraging the cost-effective utilisation of inland water transport for large-scale cargo and passenger movement across the country.

Shipping

- Approximately 95% of India's trade by volume and 68% by value is conducted through sea transport.
- India, with its **7517 km coastline**, has significant opportunities for enhancing shipping infrastructure.

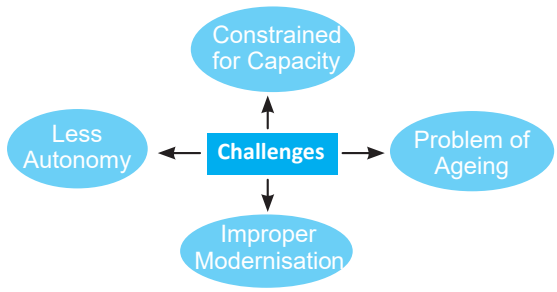


Fig. 17.12

- The country is equipped with 12 major ports (6 on the east coast and 6 on the west coast) along with approximately 200 non-major ports.
- Over the past decade, there has been a noteworthy improvement in the **average turnaround time (ATT)** at Indian ports, decreasing from 107 hours in 2011-12 to 59.5 hours in 2018-19.
- The cargo-handling capacity of ports has substantially increased through infrastructure expansions.
- According to the Economic Survey 2020-21, the installed capacity of major ports in India rose to 1534.91 million metric tonnes per annum (MTPA) in March 2020, compared to 871.52 MTPA in March 2014.
  - In FY 2019-20, the 12 major ports collectively managed the traffic of 704.92 million tonnes.

Government Initiatives

- The **Major Port Authorities Bill, 2016,** approved in 2019, is set to replace the Major Port Trust Act, 1963, providing major ports with increased autonomy in tariff fixation and asset utilisation.

Recycling of Ships Act, 2019

- The Recycling of Ships Act, 2019 prohibits hazardous materials in shipbuilding, applying to both new and existing ships.
- Existing ships get a 5-year compliance window from the Act's implementation, while the restriction is immediate for new ships.
- The Act aligns with India's 2019 accession to the Hong Kong International Convention for Safe and Environmentally Sound Recycling of Ships, 2009.

- An **MoU between India and Iran** in 2015 led to the development of Chabahar Port, with India taking over operations of two berths in 2018.
- **The Sagarmala Project, 2016**
- **Project Unnati** for benchmarking major ports,
- **Project Green Ports** for environmental improvements.
- The **National Maritime Development Project** to modernize shipping infrastructure in line with global standards.

SAGARMALA, CEZ AND PORTS

- Ports contribute significantly to the economic development of cities and states, fostering job creation, value addition, increased investment, tax revenues, and trade support by reducing logistics costs.
- A one-tonne rise in port throughput correlates with a $100 value addition, while a one-million-tonne increase creates around 300 jobs in the port region in the short term.
- India has 12 Major Ports and approximately 200 Minor Ports, and leveraging these coastal assets can significantly enhance industrial growth.
- Countries with extensive coastlines utilize ports for industrial growth, particularly in energy, materials, and manufacturing. These industries, handling significant cargo, rely on efficient port linkages.
- As logistics contributes substantially to their costs, ports play a vital role in cost reduction, enhancing the competitiveness of these sectors.
- Globally, the majority of port-handled cargo belongs to these industries, emphasizing their essential inclusion in any port-led development program.

Sagarmala Project

- India's extensive coastline and navigable waterways present natural advantages for maritime trade, constituting 90% of the country's EXIM trade. However, industrial planning has not adequately considered port proximity, leading to underutilization of port land for industries.
- The Sagarmala initiative aims to address these challenges comprehensively, reducing logistics costs, enhancing major and minor ports' capacities, and promoting port-led development.
- The initiative focuses on connecting coastal cities through road, rail, ports, and airports, encompassing coastal economic zones, smart cities, and island development.
- With over 500 identified projects under four pillars, Sagarmala targets port modernization, connectivity, port-led industrialization, and coastal community development.
- Coastal and inland waterway transportation, emphasized by Sagarmala, is energy-efficient, eco-friendly, and cost-effective, promoting a multimodal logistics optimization model.
- Waterways, railways, and roads have transportation cost ratios of **53:68:125,** highlighting the cost-effectiveness of waterways.
- The Ministry of Ports, Shipping, and Waterways is introducing **Sagarmala Seaplane services**, leveraging the vast coastline and water bodies to enhance connectivity to remote locations economically.

Sagarmala is a strategic initiative poised to transform India's maritime and port sector, driving economic growth, promoting sustainable transportation, and increasing the competitiveness of exports.

Coastal Economic Zones (CEZs)

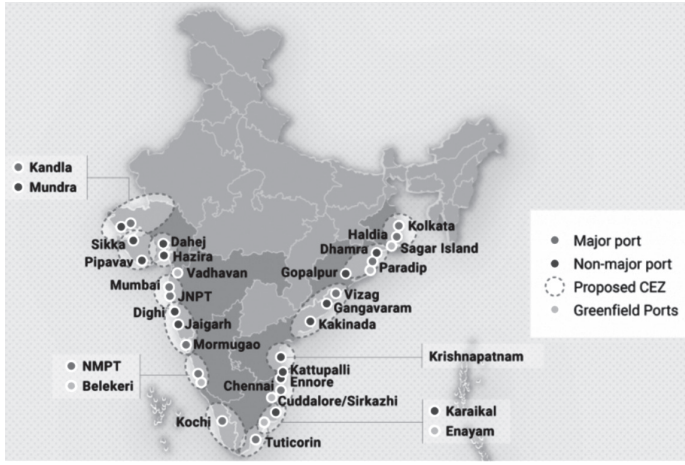


Fig. 17.13: Coastal Economic Zones

- The Coastal Economic Zones (CEZs) are defined as **economic regions** encompassing a set of coastal districts or those with robust port connections.
- Each CEZ is situated in close proximity to ports, typically within a 100 km radius, and exhibits a substantial domestic market along with export potential.
- Within the boundaries of each CEZ, there will be **multiple industrial clusters**, each equipped with distinct land banks of a minimum size determined by economies of scale analysis for the respective industry. These land parcels are designated areas capable of accommodating industrial units and the necessary infrastructure.
- Significant emphasis is placed on developing **world-class infrastructure**, including transportation, logistics, and utilities, to support industrial activities.
- Governments provide **incentives, policy support, and a conducive regulatory environment** to attract investments in CEZs.
- A total of fourteen CEZs have been identified along the country's coastline. These CEZs, capitalizing on the port ecosystem, will serve as the delineated geographical areas where port-led industrialization initiatives will be implemented.

PPP in Ports

- In 1996, the Ministry of Shipping, Government of India, introduced PPP guidelines to involve new private entities in the Major Ports sector.
- The goal was to attract private investment, **enhance efficiency, productivity, service quality, and foster competitiveness** in Indian port services.

Port

- A port operates similarly to a railway station, featuring multiple Terminals akin to platforms at railway stations.
- Ships dock at a Terminal of a port to load/unload cargo, much like trains arriving at a platform where passengers embark/disembark.

- Private players were encouraged to construct and manage additional new Terminals within existing Major Ports.
- The primary revenue source for a port operator is the fees collected from ships for loading/unloading cargo.
- Key aspects of the PPP guidelines include **selecting the private player** proposing the highest revenue share with the central government and a **30-year contract period** during which the private player builds and operates the Terminal, subsequently transferring it to the government. Models such as **Build Operate Transfer (BOT) and Build Own Operate Transfer (BOOT)** are adopted for PPP project awards.
- The inaugural PPP project in Major Ports was for **Jawaharlal Nehru Port Trust (JNPT) in Mumbai**, which involved building a new Terminal on a BOT model. The Major Port Authorities Act 2021, enacted in 2021, regulates the operation and planning of major ports in India:
  - A major port **authority** will be established for each major port.
  - Boards of Major Port Authorities will govern the administration, control, and management of major ports.
  - The board has the authority to enter into PPP agreements with private players (concessionaires),
  - Employing financial models such as revenue sharing or other similar mechanisms.
  - Concessionaires will determine tariffs based on market conditions.

Note: Importantly, since 1991, only new/additional terminals at major ports were granted to private players through PPP models. However, as outlined in the 2021-22 budget, the government plans to involve PPP players in the entire management and operations of major ports through the **Major Port Authorities Act 2021.**

Shipping Corporation Of India

- It is a government-owned **Public Sector Undertaking (PSU)** headquartered in **Mumbai**.
- Established in 1961, the Shipping Corporation of India (SCI) is currently the largest Indian shipping company.
- SCI's primary function is to **oversee and operate vessels** on both national and international routes.
- The services offered by SCI include **cruise liner and passenger services, bulk carrier and tanker services**, as well as **offshore services**.
- The Government of India granted **Navratna** status to SCI in 2008.
- Nevertheless, in November 2019, the Government of India approved the privatisation of SCI.

AIRPORTS

- India ranks as the **ninth-largest civil aviation** market globally.
- In the domestic civil aviation market, India holds the **third-largest** position worldwide.
- In airport connectivity, India shares the **top spot** with seven other nations in the **Global Competitiveness Report** 2019 by the World Economic Forum.
- According to the **Economic Survey 2020-21,** India's domestic air traffic has more than doubled from approximately 61 million passengers in FY 2013-14 to about 137 million in FY 2019-20.
- The surge in the civil aviation sector is driven by India's expanding economy, increasing purchasing power, and the growing middle class.
- India is poised to become the **third-largest aviation market** globally (combining domestic and international traffic) by FY 2024-25.

Airport Authority of India (AAI)

- The **Airports Authority of India (AAI)** was established in 1995 under the provisions of the **Airport Authority of India Act 1994** to manage airports in India.
- AAI, under the **Ministry of Civil Aviation**, is responsible for developing, upgrading, maintaining, and managing civil aviation infrastructure in India.
- It **owns and manages** a total of 136 airports, with some airports assigned to private parties for construction, operation, and maintenance, while others are solely for operation and maintenance.
- The AAI Act was amended in 2003 to provide a legal framework for airport privatization.
- The **Airport Economic Regulatory Authority (AERA)** was established as a statutory body in 2009 under the Airports Economic Regulatory Authority of India Act, 2008.
  - AERA regulates tariffs at major airports (those handling more than 35 lakh passengers annually), while tariffs at non-major airports are **regulated by the Directorate General of Civil Aviation (DGCA)** under the Ministry of Civil Aviation.

Key Government Initiatives in the Civil Aviation Sector

PPP in Airports

- In airports operated by the Airports Authority of India (AAI), the revenue streams include landing charges, parking fees, passenger service fees, cargo handling, advertising, and rentals.
- AAI traditionally handled the operation and maintenance of all airports, collecting revenues for funding operations and new airport construction.

- From 2005-06, the Indian government began entrusting the operations and management of certain airports to private operators.
- Under this model, private entities take on responsibilities such as investing in airport infrastructure, as well as operating and maintaining the airports.
- The first greenfield airport to be built as a public-private partnership in India was Cochin International Airport in the state of Kerala in 1999
- The government initiated a shift towards privatization by granting operational control of specific airports to private operators.
- The first two airports, Delhi and Mumbai, were awarded to GMR and GVK, respectively, based on a revenue-sharing model, with private operators quoting the highest revenue share gaining the responsibility.
- Six airports (Ahmedabad, Guwahati, Jaipur, Lucknow, Mangalore, and Thiruvananthapuram) are being developed under PPP mode.

National Civil Aviation Policy, 2016

- Aims to ensure safe, secure, affordable, and sustainable air travel.
- Enhances regional connectivity through fiscal support and infrastructure development.
- Focuses on boosting tourism, employment, and balanced regional growth.
- Revised the 5/20 rule to the 0/20 rule.

5/20 Rule

Under the 5/20 rule, Indian carriers had to **operate domestically for a minimum of 5 years** and **maintain a fleet of at least 20 aircraft or 20% of their fleet** (whichever is higher) before being allowed to operate international flights.

However, this rule was **scrapped by the Government of India in 2016** under the National Civil Aviation Policy.

The revised policy, known as 0/20, requires carriers to deploy only 20 aircraft in domestic operations to become eligible for international flights.

Airseva 2016

- An initiative by the Ministry of Civil Aviation for a convenient and hassle-free travel experience.

Digi Yatra

- Involves biometric-based digital processing of passengers at airports.

Foreign Direct Investment (FDI)

- Permits 100% FDI for greenfield projects under the automatic route.

Greenfield Airports

- Successfully operationalized five new greenfield airports: Durgapur (West Bengal), Shirdi (Maharashtra), Pakyong (Sikkim), Kannur (Kerala), and Kalaburagi/Gulbarga (Karnataka).

Regional Connectivity Scheme (RCS)

- The aviation sector demonstrates a **multiplier effect** on output and employment, with rates of 3.25 and 6.10, respectively.
  - This signifies that a ₹ 1 investment in the aviation sector contributes ₹ 3.25 to the economy's output, and each job created in the aviation sector leads to the generation of 6.10 jobs in other sectors.
  - Consequently, the growth in the aviation industry significantly influences investment and employment creation in the economy.
- In line with this, the Government of India introduced the **UDAN (UdeDesh ka Aam Nagarik)/RCS scheme** in 21 October 2016.
- The RCS aims to make air **travel affordable** for the masses, boost tourism, increase employment opportunities, and foster balanced regional growth.
- The scheme specifically targets smaller cities and towns in India, which were previously economically unviable for commercial airlines.
- A crucial aspect of the RCS is the development of around 450 inactive airports/airstrips in the country and the construction of new airports.
- The civil aviation ministry, in collaboration with state governments, seeks to establish "no-frills" airports at an estimated cost ranging from ₹ 50-100 crore each.
- The government's implementation strategy for the RCS comprises two main components.
  - Firstly, to **stimulate demand on underutilized routes**, it proposes to cap fares at ₹ 2500 (for 50% of the seats) for one-hour journeys covering approximately 500 km.
  - Secondly, to **make the scheme appealing to airlines**, the government plans to offer concessions and **Viability Gap Funding (VGF)**.

Concessions and Tax Benefits

- As the government intends to limit airfares on RCS routes, it plans to provide viability gap funding (subsidy) to airline operators serving these routes.
- The funding for VGF will be sourced from the **'regional connectivity fund,'** established through contributions from the Central and State governments in an 80:20 ratio.
- The Central Government will contribute to the VGF by imposing a levy of up to ₹ 8500 on each departing flight of regular domestic airlines.
- Additionally, both the central and state governments propose various tax and non-tax concessions to reduce carriers' operational expenses, including the provision of security and fire services free of charge.

Selection of the Airline Operator

- The decision to participate in the scheme lies with the states. When a state expresses interest in incorporating an airport within the RCS framework, various routes will be subject to competitive bidding.
- The selection of operators for a specific RCS route is determined by the bidder proposing the minimum VGF and involves a three-year operational commitment from the initiation of operations on a designated UDAN route.
- Each RCS route will have only one operator overseeing the flights.

Challenges

- **Carriers' financial instability** persists, with many airlines failing to turn a profit over an extended period.
- Airfare **regulations are inconsistently enforced**, resulting in occasional extremes of excessively high or disproportionately low prices.
- Severe **workforce shortages,** spanning pilots, cabin crew, air traffic controllers, and ground staff.
- **Inadequate training infrastructure,** encompassing deficiencies in training academies, instructors, and equipment.
- Airport development projects face **mismanagement** issues, including problems of overlapping or insufficient catchment areas.
- The **high cost of Aviation Turbine Fuel (ATF),** constituting around 40% of total operational costs, remains a significant challenge.

Various Agencies Related To Civil Aviation

- **Director General of Civil Aviation:** It functions as a **regulatory body** under the Ministry of Civil Aviation.
- **Bureau of Civil Aviation Security:** This agency is responsible for establishing **standards and measures** for civil flights.
- **Airport Authority of India:** Operating as a Public Sector Unit under the Ministry of Civil Aviation, it focuses on the **development, construction, and management** of airport infrastructure.
- **Pawan Hans Helicopter Limited:** Designated as a **Mini Ratna-I** category PSU, its objective is to provide **helicopter support services** for offshore exploration in the crude oil sector (to ONGC), inter-island transportation, operations in hilly and inaccessible areas, and services promoting travel and tourism.

MULTI-MODAL LOGISTICS PARK

- A Multimodal Logistics Park (MMLP) consolidates various transportation facilities in one location for end-users.
- It is defined as an **intermodal traffic handling complex** that encompasses rail, road, ship, and airplane-based transport.

- **Logistics:** Logistics encompasses the cost-effective planning, implementation, and control of the efficient flow and storage of raw materials, in-process inventory, finished goods, and related information from the point of origin to the point of consumption. Its functions involve order processing, inventory planning, management, packaging, warehousing, and transportation.
- **Multimodal transport:** It involves moving goods from one point to another using multiple modes of transportation. It forms an interconnected chain that combines air, sea, and land transport into a seamless process. This ensures a cost-effective and efficient door-to-door movement of goods, managed by a single transport operator known as a Multimodal Transport Operator (MTO) under a single contract/ transport document.

- The MMLP includes container terminals, bulk cargo terminals, warehouses, banking and office spaces, as well as facilities for mechanized handling, sorting/ grading, cold chain, and aggregation/desegregation to efficiently manage freight traffic.
- Key components of MMLPs include **warehousing, transport, and value-added services**. This concept is relatively new in India.
- In India, logistics service providers are predominantly small players, often part of the unorganized sector.
- Among organized logistics players, only a few offer services across multiple modes (air, water, rail, and road) and a range of services such as transportation, warehousing, and value-added services like packaging, cold chain, and customs clearance. This leads to higher logistics costs in India compared to a less favorable model mix.
- Logistics accounts for 18% of the total product cost in India, while it ranges from 8-12% in China and 12% in Europe. Therefore, the focus should shift towards integrated transport solutions instead of individual transportation and distribution services.

Why MMLPs?

- Multi Modal Logistics Parks (MMLPs) offer a promising solution for reducing logistics costs in India. They are anticipated to achieve cost savings through four core functions: **Freight aggregation and distribution, MultiModal freight transportation, modern warehousing with specialized facilities for various commodities, and value-added services** like customs clearance with bonded storage yards and warehousing management services.

- Establishing a network of MMLPs as logistics hubs addresses issues related to an unfavorable modal mix, inefficient fleet composition, and an underdeveloped material handling infrastructure.
- These logistics parks facilitate the shift from the current point-to-point freight movement to an optimal hub-and-spoke model.
- With MMLPs situated on the outskirts of Mumbai and Delhi, cargo from production areas near JNPT/Thane/ Mumbai suburbs is first aggregated in the Mumbai MMLP.
  - Subsequently, it is transported to the Delhi MMLP on larger trucks or railways for disaggregation, before being distributed to Gurgaon/NOIDA via smaller trucks.

Advantages of Multi-Modal Logistics Parks (MMLPs)

- **Cost Reduction:** MMLPs decrease transportation costs by selecting the most efficient mode for goods movement.
- **Inventory Cost Reduction:** By reducing transit time, MMLPs lower inventory costs for both logistics operators and end-users.
- **Optimal Asset Utilization:** With shorter transit times, MMLPs enhance the utilization of assets like rail infrastructure, roads, and warehouses, reducing per-unit transportation costs significantly.
- **Modal Optimization:** MMLPs facilitate optimal modal choices and foster balanced growth across all modes of transport.

Challenges in Logistics

- **Infrastructure Quality:** The Indian logistics market faces higher costs due to the poor quality of road and rail infrastructure.
- **Fragmented Road Transportation:** The road transportation sector comprises numerous small, unorganized players lacking industry consolidation and economies of scale.
- **High Rail Freight Tariffs:** India's rail freight tariffs rank among the highest globally.
- **Rail Freight Inefficiencies:** Rail freight lacks reliability, quality operations, speed, and customer orientation.
- **Connectivity Issues:** Challenges exist in the connectivity between air freight ports and hinterlands through rail and road.
- **Port Inefficiencies:** Delays and inefficiencies in loading and unloading vessels at ports.

Government Initiatives: The government plans to construct 35 multi-modal logistics parks, with the first park announced in Assam at Jogiphopa.

POWER SECTOR

In recent years, India has seen substantial growth in power generation, but the power distribution sector faces challenges. State distribution companies (DISCOMs) struggle financially, causing power cuts, while power generators operate below full capacity due to surplus power. The issue arises from successive state governments' failure to implement crucial reforms.

Power Distribution Challenges and Proposed Reforms

The power sector's primary challenge lies in electricity distribution, where state-owned DISCOMs face structural issues:

- **Government Interference:** State interference in state-owned DISCOMs hampers professional functioning.
- **Infrastructure and Technology:** Poor distribution infrastructure, coupled with a lack of capital and technology, impedes upgrades.
- **Tariff Constraints:** Government-controlled tariffs restrict DISCOMs' ability to increase electricity rates, hindering infrastructure improvement due to financial constraints.
- **Populist Policies:** DISCOMs, controlled by state governments, often serve as tools of populism, offering free or subsidized power to farmers and consumers.
- **Cross Subsidization:** Higher tariffs for industrial consumers offset government losses in providing subsidized power to households and farmers.
- **Financial Burden:** Aggregate Technical and Commercial (AT&C) losses, 17% in FY2022 22% in FY2021, impose a significant financial burden on DISCOMs.

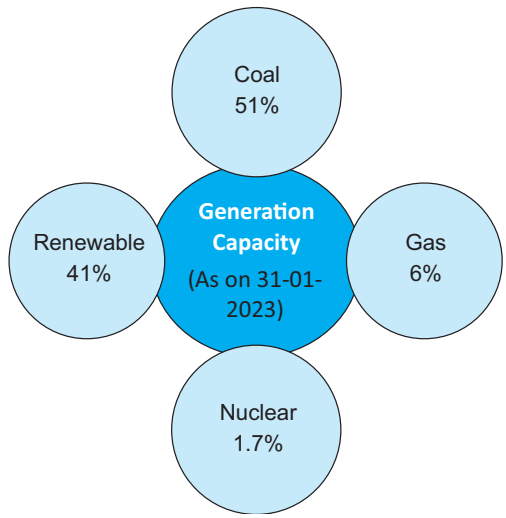


Fig. 17.14: Generation Capacity

Proposed Reforms in Electricity Amendment Bill 2022

- **Delicensing and Private Participation:** Proposes delicensing the power distribution sector, allowing private DISCOMs.

- **Dispute Resolution:** Strengthens the Appellate Tribunal for Electricity to expedite dispute resolution.
- **Direct Benefit Transfer (DBT):** Introduces DBT for electricity subsidies, targeting the poor directly.
- **Universal Obligation Fund:** Establishes a fund to address deficits in cross-subsidies.
- **Penalty Increase:** Raises penalties for DISCOMs failing to meet Purchase Obligations (RPOs).

"Making One India" in the Power Sector (Open Access)

- The Electricity Act of 2003 establishes a framework allowing electricity generators and consumers the flexibility to choose their power transaction partners.

Cross-Subsidy in Indian Electricity Tariffs

Indian industrial/commercial consumers pay higher tariffs to subsidize affordable rates for domestic and agricultural consumers—a practice known as cross-subsidy, continuing under the Act. If commercial consumers opt to buy power from independent generators, the distribution licensee loses cross-subsidy. To prevent passing on this amount to domestic and agricultural consumers, a Cross-Subsidy (CS) Surcharge is imposed on commercial consumers, averting a significant increase in power costs for households and farmers.

- The Act aims to gradually reduce and eliminate Cross Subsidy (CS) surcharges, paving the way for a unified market and the vision of "Making one India."
  - Power Exchanges, established in 2008, facilitate open access policy, fostering a national electricity market with competitive bidding for price discovery.
  - However, barriers such as increased cross subsidies and additional surcharges for power exchange transactions hinder the realization of a single market.
  - Currently, Open Access is limited to specific industrial customers and not extended to households.

Renewable Energy in India

- Fossil fuels, a major global energy source, contribute to global warming through greenhouse gas emissions.
- In commitment to environmental sustainability and recognizing the disproportionate impact on the poor, India aims for a green development process.
- The **clean energy cess** on coal has transitioned into a GST Compensation Cess of ₹ 400 per tonne under GST.
- The government targets achieving 50% of its energy needs from non-fossil fuels, primarily renewables, by 2030, as announced at COP26.
- Renewed emphasis on renewable energy has led to **declining tariffs** for electricity generated from renewable sources in recent years.

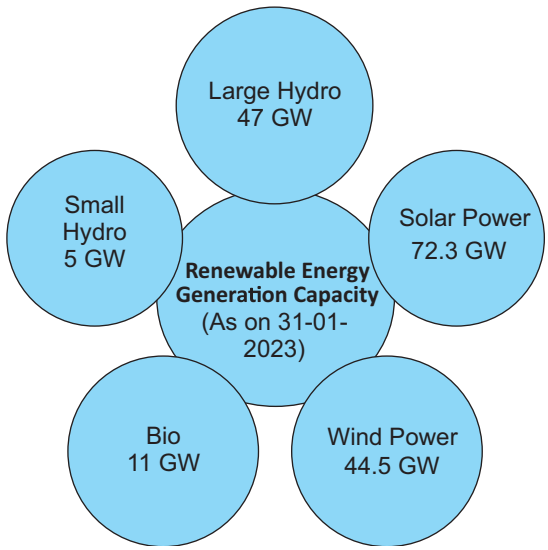


Fig. 17.15: Renewable Energy Generation Capacity

Renewable Energy Sources (RES)

Solar Energy Sector

- The government's initiatives in solar energy include:
  - **Solar Rooftop:** Implemented under the National Solar Mission, aiming to add grid-connected rooftop systems over a 5-year period.
  - **Solar Park:** Around 57 Solar Parks with aggregate capacity 39.28 GW sanctioned in 22 states. Bhadla Solar Park in Rajasthan, with a capacity of 2,245 MW, is the world's largest, and Shakti Sthala in Karnataka is the second-largest.
  - **Solar Pumps:** Over 2.5 lakh solar pumps installed for irrigation and drinking water purposes by 2019-20.
  - **Solar Cities:** Approval of 60 city projects under the development of solar cities program.

International Solar Alliance (ISA)

India launched the International Solar Alliance (ISA) in 2015, comprising 121 countries, primarily located between the Tropic of Cancer and the Tropic of Capricorn. The primary objective of ISA is to facilitate the effective harnessing of solar energy. While nations outside the Tropics can also join, they are entitled to all benefits except voting rights. The headquarters of ISA is situated in Gurugram, Haryana.

  - **Surya Mitra Scheme:** Aims to train 50,000 personnel in the solar energy sector within 5 years.
  - **Solar Study Lamps:** Distribution of around 60 lakh solar study lamps to students in five states till 2019-20.
  - **National Solar Mission:** Aims to reduce the cost of solar power through policy, research, development, and production. The Solar Energy Corporation of India (SECI) was created in 2011 to facilitate its implementation.

- **Atal Jyoti Yojana (AJAY):** Launched for installing solar street lights initially in five states and later extended to other regions.
- **Atal Solar Rooftop User Navigator (ARUN):** A mobile app launched in 2017 to promote solar rooftop systems and provide assistance and installation.
- **Kisan Urja Suraksha Evam Utthaan Mahabhiyan (PM-KUSUM) scheme:** Launched in 2019 with three components aiming to add a solar capacity of 25,750 MW by 2022, including decentralised grid-connected solar power plants, stand-alone solar agriculture pumps, and solarisation of grid-connected agriculture pumps.

Solar Photovoltaics Manufacturing in India

- The solar PV panel manufacturing supply chain comprises **silicon production** from silicates, **solar-grade silicon ingots** production, **solar wafer** manufacturing, and **PV module assembly**.
- The capital expenditure and technical complexity decrease progressively from silicon production to module assembly.
  - Most Indian companies focus on module assembly or wafer manufacturing, with limited involvement in silicon production.
- India's solar cell manufacturing capacity is around 3 GW annually, while the demand is approximately 20 GW, leading to significant imports, primarily from China.
- In the solar panel manufacturing sector, India **permits 100% foreign investment as equity with automatic approval**.
- Despite a substantial shortfall in domestic manufacturing, **India ranks third** globally in solar installed capacity.
- The country is making strides towards achieving its **Paris Agreement NDC targets**, including a 40% non-fossil-fuel-based installed power capacity, a 33-35% reduction in emissions, and creating a carbon sink of 2.5 to 3 billion tonnes of CO_2 by 2030.
- India's energy consumption is only one-third of the world's average, providing significant expansion potential.
  - However, 73% of the country's greenhouse gas emissions result from energy production, emphasizing the need for aggressive electrification from cleaner fuels.
- Solar PV manufacturing is identified as a strategic champion sector under the **Aatmanirbhar Bharat** initiative.

Wind Energy Sector

- India ranks **fourth** globally in wind power installed capacity, totaling 44.089 gigawatts (GW) nov 2023.
- Gujarat tops at 11,062 MW Tamil Nadu has an installed wind energy capacity of 10,247 MW.
- In the fiscal year 64.54 billion units electricity produced from Wind Energy during April, 2022-January, 2023.
- The government encourages private sector investment through incentives like **accelerated depreciation and concessional custom duty exemption**.
- Moreover, the **Generation Based Incentive (GBI) Scheme** was applicable to wind projects commissioned until March 31, 2017.
- The **National Wind-Solar Hybrid Policy,** introduced in 2018, aims to promote large grid-connected wind-solar PV hybrid systems for optimal resource utilization, reducing variability in renewable power generation, and enhancing grid reliability.
  - The policy includes criteria for recognizing hybrid plants and provisions for existing projects to avail benefits by installing solar PV plants.
- The **Central Electricity Authority (CEA)** and **Central Electricity Regulatory Commission (CERC)** are tasked with **formulating standards and regulations** for wind-solar hybrid systems.

Tidal Energy Sector

- The difference in water elevation between low tide and high tide holds potential energy.
- The recognized tidal energy potential in India is approximately 12,455 MW, primarily situated in the **Gulf of Khambhat** and the **Gulf of Kutch** in Gujarat.
- Nevertheless, the capital expenses for tidal energy power plants are considerably high due to elevated civil construction costs and a high power purchase tariff.

Biogas and Biogas Energy Sector

- **Biogas:** Biogas, derived from **cow dung** through gobar gas plants, serves various purposes such as cooking, lighting, heating, and electricity generation. The **National Biogas and Manure Management Programme (NBMMP)**, overseen by the Ministry of New and Renewable Energy, has successfully installed over 50 lakh family-type biogas plants.
- **Biomass:** Biomass energy, derived from **plants and trees** like coconut shell, straw, bagasse, and rice husk, aims to promote afforestation for energy production. The **Biomass Power and Cogeneration Programme** has successfully installed 643 MW capacity, focusing on efficient utilization of biomass resources for grid power generation.

National Policy on Biofuels, 2018

The National Policy on Biofuels, 2018, is a comprehensive framework aimed at **promoting the production and use of biofuels** in India. The key elements of this policy include:

- The classification of biofuels into 'basic biofuels' and 'advanced biofuels.'
- Providing incentives, off-take assurance, and viability gap funding for advanced biofuels.
- Authorization of B-molasses, sugar beet, sweet sorghum, starch-containing materials such as corn and cassava, and damaged food grains like wheat, broken rice, and deteriorated potatoes—unsuitable for human consumption—for ethanol production.
- Establishment of supply chain mechanisms for biodiesel production from non-edible oilseeds, used cooking oil, and short-gestation crops.
- Ensuring collaboration and coordination among various ministries or departments involved in biofuels by defining their respective roles and responsibilities.

Small Hydro Energy Sector

- Small hydro projects in India, with a capacity of 25 MW or below, fall under the Ministry of New and Renewable Energy (MNRE).
- The ministry took charge of hydro power plants with a capacity up to 3 MW in 1989, transferring them from the Ministry of Power.
- MNRE has initiated various projects to promote small hydro, including UNDP-GEF assisted projects like "Optimizing Development of Small Hydro Resources in Hilly Regions of India" and the India-Renewable Resources Development Project with an IDA credit line. The latter includes a small hydro development component, aiming to achieve 100 MW through private sector participation, particularly in canal-based small hydro power projects.

Large Hydro Energy Sector

- Large hydro power projects in India refer to those with a capacity **exceeding 25 megawatts** (MW).
- These projects are designed to generate a significant amount of electricity and contribute to the overall energy infrastructure of the country.
- Large hydro power projects play a crucial role in meeting the growing energy demand and are often managed by the **Ministry of Power** in India.
- They harness the energy of flowing water to produce electricity on a substantial scale, making them a key component of India's power generation portfolio.

Renewable Energy Certificates (RECs)

- Renewable Power Generators, after feeding energy into the grid, receive RECs, tradable as an energy commodity in the market.
- RECs, market-based instruments, **certify ownership of one megawatt-hour (MWh)** of renewable energy.
- They serve as proof for energy generation from sources like solar or wind power.
- Purchasing RECs represents the generation of renewable energy on behalf of the buyer.
- These are also known as green tags, traceable renewable certificates (TRCs), renewable electricity certificates, or renewable energy credits.
- To boost renewable energy goals, entities like power distribution companies and captive power plants are obligated under **Renewable Purchase Obligations (RPOs)** to buy energy from renewable sources.
- These obligations can be fulfilled by purchasing RECs from **Indian Energy Exchange (IEX)/Power Exchange of India (PXIL)** or renewable power from the **National Load Dispatch Centre (NLDC)**.
- RPOs, uniformly set for all States/UTs by the Ministry of Power in consultation with the Ministry of New and Renewable Energy, form the **backbone of India's renewable energy program**.

Global Energy Transition Index

- Published **annually** by the **World Economic Forum (WEF)**, it compares the energy sectors of 120 countries.
- The index assesses a country's attempt to balance the **Energy Triangle**, encompassing energy security and access, economic development and growth, and environmental sustainability.
- **Six indicators** are considered in the index calculation: capital and investment, regulation and political commitment, institutions and governance, infrastructure and innovative business environment, human capital and consumer participation, and energy system structure.

Energy Transition Index (ETI) 2023

- **India holds the 67th position** worldwide.
- **Sweden claimed the top spot** on the list, with Denmark, Norway, Finland, and Switzerland comprising the top five among the 120 countries ranked.
- France secured the 7th position, standing as the lone G20 country in the top 10, while Germany followed closely at 11th, the U.S. at 12th, and the U.K. at 13th.

Recent Government Interventions

- **Power System Operation Corporation (POSOCO)** serves as the nodal agency for significant power sector reforms like the Renewable Energy Certificate mechanism.
- The **National LED Programme (UJALA)** promotes energy-efficient LEDs, distributed at a subsidized rate of 40% by Energy Efficiency Services Limited (EESL).

- **Deen Dayal Upadhyaya Gram Jyoti Yojana** focuses on 24 × 7 power supply by enhancing rural sub-transmission and distribution infrastructure.
- **Sahaj Bijli Har Ghar Yojana (SAUBHAGYA)** aims to provide electricity connections to over 40 million families, identified through Socio-Economic and Caste Census (SECC) 2011.
- The **PRAAPTI App and Web Portal** enhance transparency in generator invoicing and power purchase transactions.
- **Ujwal DISCOM Assurance Yojana (UDAY)** was launched by the Ministry of Power and approved on 5th November 2015. The scheme envisions:
  - Financial recovery
  - Enhanced operational efficiency
  - Decreased power generation costs
  - Promotion of renewable energy
  - Energy efficiency and conservation

Draft National Energy Policy (NEP) 2040

The Draft National Energy Policy (NEP) 2040, also known as the **Energy Strategy**, outlines a comprehensive vision to position India as **'Energy Ready' by the year 2040**. The primary objectives of this draft policy encompass various facets of the energy sector with a focus on ensuring holistic development, sustainability, and independence. The key goals are as follows:

- **Access to Energy at Affordable Prices**
  - Ensuring widespread availability of energy to all segments of society.
  - Striving for affordability to make energy accessible to a larger population.
- **Improved Security and Independence**
  - Enhancing energy security to safeguard against disruptions in supply.
  - Reducing dependence on external sources through strategic initiatives.
- **Greater Sustainability and Economic Growth**
  - Promoting sustainable practices to minimise environmental impact.
  - Correlating energy policies with economic growth to ensure mutual benefits.
- **Shift to Less Energy-Intensive Modes of Transport**
  - Encouraging the adoption of energy-efficient and sustainable transportation modes.
  - Reducing the overall energy intensity in the transportation sector.
- **Transition to Renewable Sources of Energy**
  - Increasing the share of renewable energy in the overall energy mix.
  - Promoting the development and utilisation of solar, wind, and other clean energy sources.
- **Exploration of Hydroelectric Power (to Meet Peak Demand)**
  - Tapping into the potential of hydroelectric power to address peak demand requirements.
  - Enhancing the efficiency and capacity of hydroelectric projects.
- **Development and Usage of Energy-Efficient Technology**
  - Investing in research and development of energy-efficient technologies.
  - Encouraging the adoption of energy-efficient practices across industries and sectors.
- **Substitution of Natural Gas for Oil Products**
  - Promoting the use of natural gas as a cleaner alternative to traditional oil products.
  - Focusing on the substitution of oil-based products with natural gas in various applications.

The draft NEP 2040 thus envisions a comprehensive and integrated approach to meet India's energy needs, balancing economic growth, environmental sustainability, and energy security.

COAL

- India, ranking **second in coal production and consumption** globally, relies on coal for about 53% of its energy.
- Coal production in 2019-20 reached 729.1 million tonnes but faced a decline in 2020-21 due to factors like the COVID-19 pandemic.
- Major consumers include thermal power stations, steel plants, cement factories, railways, fertiliser units, and brick kilns.
- Challenges in the coal sector include **insufficient mining technology, high mining costs, and environmental degradation**.

IGNITE YOUR MIND

According to The Press Information Bureau, India's per capita energy consumption was 1255 kWh in 2021-22, which is about one third of the global average of per capita energy consumption. Hence, it is often said that India faces a condition of energy poverty, which, in some ways, is worse than the condition of income poverty. List some schemes and policies of the government to reduce energy poverty in India. Can you think of some innovative ways to generate power in our own homes?

- Recent government interventions include
  - the establishment of **Coal India Limited (CIL)** in 1975, which is a Maharatna PSU.

- The **Coal Mines Act, 2015** enhances transparency in coal mine allocation.
- Coal-Based **Ultra Mega Power Projects (UMPPs)** with a capacity of 4,000 MW or more were initiated through competitive bidding, with 4 out of 15 UMPPs awarded.
- The **Coal Mitra Web Portal (2016)** promotes flexible coal utilization, and the **Scheme for Harnessing and Allocating Koyala Transparently in India (SHAKTI) (2017)** handles the auction and allocation of long-term coal linkages transparently.
- Moreover, efforts like the **Carbon Sink initiative**, planting 132 million trees on 54,500 ha of land (2020-21), contribute to estimated carbon sequestration of 2.7 lakh tonnes of CO_2 equivalent/year. Future plans include covering an additional 20,000 ha by planting around 50 million trees by 2030.

COAL MINES ACT 2015 AND MMDR ACT 2015

- In India's federal structure, the regulation of mines and mineral development is under the Union List.
- The Central Government formulates rules for minerals, except coal, petroleum, natural gas, and atomic minerals, which it manages.
- State governments handle mining activities within their boundaries and collect taxes/royalties on mineral rights.
- The Central Government owns minerals in territorial waters, while states grant mineral concessions within their boundaries under the **Mines and Minerals (Development and Regulation) Act, 1957**.
- The MMDR Act 1957 applies to all minerals, with special provisions for coal under the **Coal Mines Act 2015**.
- The **Coal Mines (Nationalization) Act 1973** initially gave Coal India Ltd a monopoly.
- Amendments allowed private companies and PSUs for captive mining, limited to specific projects without selling coal in the open market.
- Earlier, coal blocks were allocated without bidding, leading to the **'Coalgate scam**,' stopped by the Supreme Court in 2014.

Coal Mines (Special Provisions) Act 2015

The Key Features of The Act Include

- **Auction Mechanism:** Coal mine allocation is through **transparent (electronic) auction**, except for government companies, which may be allotted without auction.
- **End-use Restrictions Removed:** End-use restrictions for captive mining are lifted, allowing companies to sell coal in the market obtained through auctions.
- **Types of Auctions:** The government conducts auctions for **commercial mining** (allowing coal sale in the open market and export) and **captive mining** (for specific sectors like steel/power, limited to the bidder's projects).
- **Revenue Disbursement:** Proceeds from the auction are disbursed to the respective state governments.

Economic Impact of Coal Sector Reforms

- **Efficiency and Competition:** The reform, the most ambitious since 1973, aims to enhance efficiency and introduce competition in coal production.
- **Investment and Technology:** Attracting investments and best-in-class technology, especially for safe and efficient mining, is expected, fostering technological advancements in the sector.
- **Job Creation:** The reforms are anticipated to generate both direct and indirect employment opportunities in the coal sector.
- **Transparency and Ease of Doing Business:** The new law prioritizes transparency and ease of doing business, ensuring that natural resources contribute to national development.
- **Revenue to Coal-Bearing States:** With the entire auction revenue going to coal-bearing states, there is potential for increased revenues, incentivizing growth and development in economically lagging areas.
- **Reduction in Import Dependency:** Volume growth and cost reduction from commercial coal mining are expected to curb the need for importing coal, thereby reducing the strain on foreign exchange reserves.
- **Industry Consolidation:** The reforms may lead to industry consolidation, fostering the rise of large vertically-integrated energy companies involved in coal mining, power generation, transmission, and distribution.
- **Lower Energy Costs:** The utilities and manufacturing sectors are likely to benefit from lower energy costs resulting from the reforms.
- **Auction Mechanism:** The government's use of a revenue-sharing basis in the auctioning of coal blocks for commercial mining ensures a competitive selection process based on companies offering a maximum share of revenue to the government.

Salient Features of Mines and Minerals (Development & Regulation) Act 1957

- **Auction Mechanism for Mining Leases:** State Governments grant Mining Leases through competitive bidding, including electronic auctions, enhancing transparency and eliminating discretion.
- **Increased Government Share:** Besides royalties and taxes, companies now commit to paying a specified amount per tonne during the auction process, increasing the government's share in the mining sector revenue.
- **Extended Lease Period:** Mining Leases are now granted for 50 years without renewal, replacing the previous practice of a 30-year lease with renewals.

- **Stringent Penalties:** To combat illegal mining, the Act imposes higher penalties and jail terms, with provisions for special courts under state governments to expedite trials related to illegal mining cases.
- **Central Government Intervention:** The Central government has the authority to intervene where state governments default on their responsibilities.
- **District Mineral Foundation (DMF):** The Act mandates the creation of DMFs by state governments in mining-affected districts. These foundations aim to benefit individuals affected by mining-related operations in those districts.

CRUDE OIL

- Crude oil production in India has steadily declined since 2014-15, impacting both onshore and offshore operations. This decline is attributed to the natural **ageing of fields** with no major discoveries.
- India, as the **third-largest crude oil importer** globally, holds a storage capacity of 5.3 million tonnes.
- Existing reserves are expected to last only about two decades at the current production rate.
- Less than one-fifth of crude oil consumption is met through domestic production, with the majority being imported, leading to significant reliance on oil imports and utilising around 50% of export earnings to pay oil bills.
- **Recent government interventions include:**
  - **Opening up crude oil exploration and production to the private sector**, with private/joint ventures contributing around 20% in 2019.
  - The **Administered Pricing Mechanism (APM)** has been dismantled.
  - Allowing domestic companies **to acquire international oil reserves**.
  - The **Hydrocarbon Exploration and Licensing Policy (HELP)**, introduced in 2016, replaced the **New Exploration and Licensing Policy (NELP)** of 1997. HELP streamlines exploration and production licences for conventional and non-conventional hydrocarbon resources.
  - The **Hydrocarbon Vision 2030** for the North East aims to double oil and gas production by 2030, promoting clean fuel, expediting project completion, creating employment, and fostering cooperation with neighbouring countries.
  - Additionally, the **Pratyaksh Hanstantrit Labh (PAHAL),** modified and reintroduced in 2015, is recognized as the largest direct benefit transfer scheme in the Guinness Book of World Records.
  - According to the Economic Survey 2020-21, India is the world's third-largest energy consumer, with 5.8% of global primary energy consumption. The energy consumption basket is dominated by coal and crude oil, with indigenous crude oil production declining to 32.17 million metric tonnes in FY 2019-20. Processed crude oil for the same period decreased by approximately 1.1%.

NATURAL GAS

- Major natural gas reserves are concentrated in states like Maharashtra (Mumbai), Gujarat, Tripura, Andhra Pradesh, Tamil Nadu, and Rajasthan.
- In the fiscal year 2019-20, natural gas production decreased to 31.18 billion cubic meters.
- Government-owned PSUs dominate natural gas production, accounting for over 80% of the share.
- To encourage private sector participation, the government has implemented measures such as
  - simplified fiscal and contractual terms,
  - bidding of exploration blocks in sedimentary basins without production or revenue sharing,
  - early monetization of discoveries with fiscal incentives,
  - incentivizing gas production,
  - allowing marketing and pricing freedom,
  - introducing the latest technology and capital, and
  - providing more functional freedom to national oil companies for collaboration.
- The **National Gas Grid** initiative aims to develop a 27,000 km natural gas pipeline network across the country, connecting gas sources to major demand centres and ensuring gas availability to consumers in various sectors. The **Petroleum and Natural Gas Regulatory Board (PNGRB)** is authorised to grant entities the authorization for developing the **City Gas Distribution (CGD) network**.

Petroleum and Natural Gas Regulatory Board (PNGRB)

Established in 2006 under the PNGRB Act, it **regulates the entire spectrum of petroleum and natural gas activities** in India, excluding production. PNGRB ensures a consistent and ample supply of these resources across the nation.

Petroleum Planning and Analysis Cell (PPAC)

Founded in 2002 and affiliated with the **Ministry of Petroleum and Natural Gas**, PPAC plays a crucial role in subsidy administration, maintains data systems for emergencies, analyzes international oil market trends, and forecasts import/export patterns. Its funding is provided by the **Oil Industry Development Board**, and it operates from **New Delhi**.

Oil and Gas Sector

- In 1991, the Indian government initiated private participation in oil and gas exploration.

- The **New Exploration and Licensing Policy (NELP)** introduced in 1997-98 adopted a **profit-sharing model** for contractor selection, remaining in effect for 18 years.
- In 2016, the government introduced the **Hydrocarbon Exploration and Licensing Policy (HELP)** with the following features:
  - **Uniform Licensing System:** Encompassing all hydrocarbons under a single license and policy framework.
  - **Open Acreage Licensing Policy (OALP):** Allows bidders to propose exploration in any unallocated block, fostering faster coverage of geographical areas.
  - **Revenue Sharing Model:** Contracts based on a "revenue sharing" model, with bidders quoting a percentage of revenue share to the government. This model requires revenue sharing from the first year of production, regardless of the operator's profitability.
  - **Gas Pricing and Marketing:** Operators have pricing and marketing freedom for domestically produced gas on an arm's length basis.
  - **Royalty Incentives for Offshore Exploration:** Graded royalty reductions for offshore exploration—7.5% for shallow water, 5% for deep water, and 2% for ultra-deep water—aimed at incentivizing exploration in higher-risk and cost-intensive offshore areas.

Note: As of the 2019-20 Economic Survey, India ranks as the third-largest energy consumer globally after the USA and China but faces declining oil production. Despite being a major energy consumer, India's per capita energy consumption is only 30% of the world average.

Kirit Parikh Committee Recommendations on Gas Pricing

The committee aimed to **enhance domestic gas production** to achieve 15% of energy from gas by 2030 while ensuring fair prices for consumers. It addressed gas pricing from two sources:

- **Legacy Fields (APM Gas)**
  - **Recommendation:** Link pricing to imported crude oil with a floor ($4MMBTU) and ceiling ($6.5MMBTU) until a specified date, followed by complete pricing freedom from January 1, 2027.
- Challenging Geology Fields (Deep-Water, Ultra-Deep Water, High Pressure-High Temperature):
  - **Recommendation:** Producers in challenging geology have marketing and pricing freedom with an upper bound set by the government. The committee suggests maintaining this cap for three years and granting total pricing freedom from January 1, 2026, by eliminating the cap.

TELECOM SECTOR

- The Indian telecom network, ranking second globally in telephone connections, contributes approximately 6.5% to the country's GDP.
- With over 118 crore telephone connections, of which more than 115 crore are wireless, the mobile industry plays a significant role.
- Over 98% of total telephones are wireless, and the private sector holds an 88.60% share.
- However, challenges like intense competition, price cuts, and the world's lowest data prices have led to financial stress, bankruptcies, and mergers among telecom service providers, impacting both BSNL and MTNL.

Recent Government Initiatives in Telecom Infrastructure

National Optical Fibre Network (NOFN)

- Launched in 2011, renamed **BharatNet** in 2015.
- Part of the Digital India program to provide broadband connectivity to all 2.5 lakh Gram Panchayats.
- Aims for an **affordable broadband connection** of 2 Mbps to 20 Mbps for households.
- As of August 2019, 1.25 lakh GPs were connected under BharatNet.

Public Wi-Fi Hotspots

- Enhances last-mile broadband delivery, particularly in congested areas.
- Easier to scale than adding new mobile towers.
- Improves connectivity in buildings, airports, etc.
- Facilitates offloading from telecom networks to reduce congestion.
- As of 2021, India had around 8 million public Wi-Fi hotspots. However, as of July 2023, India has only 0.5 million public Wi-Fi hotspots, falling short of the government's 2022 target of 10 million.

National Digital Communication Policy, 2018

- **Objectives:**
  - Provide broadband for all.
  - Generate 4 million jobs in the digital communication sector.
  - Increase the digital communication sector's contribution to India's GDP to 8%.
  - Rank India among the top 50 nations in the ICT Development Index of ITU.
  - Boost India's contribution to global value chains.
- **Strategies:**
  - Establish **National Broadband Mission (NBM)** to achieve universal broadband access.
  - Implement '**Fibre First Initiative**' for fiber-to-home, enterprises, and key institutions.

Tele-Density

- It reflects the quantity of telephones for every hundred individuals.
- This metric is a crucial gauge of telecom penetration.
- As of November 2020, India's total tele-density is 86.6%, with rural and urban tele-densities at 59.1% and 139.0%, respectively.

- **Lay optical fiber** under NBM, covering 1.63 lakh GPs, with 1.51 lakh GPs service-ready.
- Create a **National Digital Grid** through the National Fibre Authority.
- Develop **Broadband Readiness Index** for States/UTs to attract investments and address **right of way (RoW) challenges**.
- Formulate a transparent policy for spectrum assignments, optimize satellite communication, and promote **Open Access Next-Generation Networks**.

DIGITAL PUBLIC INFRASTRUCTURE

- Digital Public Infrastructure (DPI), launched in 2009 with the introduction of **Aadhaar**, has significantly contributed to the upliftment of the economy, fostering financial literacy, innovation, entrepreneurship, and employment generation.
- Over the past fourteen years, the journey of DPI has been noteworthy, driven by favourable demographics, the substantial growth of the middle class, and evolving digital behaviour patterns.
- Harnessing these growth drivers, India has successfully established a robust digital economy, empowering individuals and businesses to engage in paperless and cashless transactions.

MyScheme

- The introduction of 'MyScheme' aimed to address the challenge of beneficiaries lacking awareness about available schemes.
- Serving as an **e-Marketplace for schemes**, MyScheme allows users to easily find suitable schemes based on eligibility criteria, streamlining the process and eliminating the need to navigate various government department websites.
- Additionally, it serves as the **singular national platform for launching government schemes**.
  - As of January 16, 2023, the portal hosts more than 181 Central and State/UT government schemes across 14 diverse categories.

Unified Mobile Application for New-Age Governance (UMANG)

- To enhance accessibility to e-Government services, the government introduced the Unified Mobile Application for New-Age Governance (UMANG), enabling citizens to access services across various sectors.
- As of January 16, 2023, UMANG offers around 21,869 services (1,672 Central and State Govt. services and 20,197 Bill Payment services) from 310+ departments of the Central Government and departments of 34 States/UTs.
- With over 4.9 crore registered users, UMANG has facilitated 489 DBT (Direct Benefit Transfer) schemes, including providing crucial services during the Covid-19 pandemic, with around 4.9 lakh advance claims raised via the platform until September 2022.

Open Network for Digital Commerce (ONDC)

- The Open Network for Digital Commerce (ONDC) stands out as a unique initiative with a distinctive approach to digital commerce.
- Unlike the prevalent platform-centric model, ONDC introduces a **network-based open protocol** connecting buyers and sellers across **Business-to-Consumer (B2C)** and **Business-to-Business (B2B)** landscapes.
- This innovative framework allows consumers to discover sellers, products, or services through any compatible application or platform, providing them with enhanced **freedom of choice**.
- The beta test of ONDC in Bengaluru represents a significant stride towards operationalizing a network-oriented e-commerce approach, fostering inclusivity, accessibility, and an enriched experience for consumers and sellers, particularly benefiting small businesses with increased decision-making freedom.

OpenForge

- The government recognizes the importance of enhancing human capital productivity.
- To foster collaborative **software development** for e-governance applications, the platform OpenForge has been established.
- OpenForge encourages the **utilisation of open-source software** and facilitates the **sharing and reuse of e-governance-related source code**.
  - As of January 16, 2023, the platform boasts 10,328 users and hosts 2,205 projects.

National AI Portal

- The government has prioritized the accessibility of open resources on Artificial Intelligence (AI).
- The national AI portal has been established **to enhance the AI ecosystem** by consolidating and showcasing the latest developments from Central and State Governments, industry, academia, NGOs, and civil societies.
- As of January 16, 2023, the portal has published 1724 articles, 829 news items, 276 videos, 127 research reports, and 120 government initiatives, all focused on AI.

Digital India Bhashini Portal

- In India, with its rich linguistic and cultural diversity, AI serves as a powerful tool to overcome language barriers.
- Launched in July 2022, 'Bhashini,' the National Language Translation Mission, aims **to foster Indian language technologies and solutions as a public good**.
- The Digital India Bhashini portal provides a **public digital platform with 260 open-source API-based AI models** for speech-to-text conversion, machine translation, and text-to-speech conversion in 11 Indian languages and English.
- This initiative holds the potential to extend internet and digital resource access to millions of Indians in their native languages.

Open Credit Enablement Network (OCEN)

- The dynamic digital landscape is witnessing rapid changes with the advent of overarching technologies.
- **'Web 3.0,'** the third generation in web technologies, represents a transformative shift in the internet experience, impacting how it is used, websites are managed, and internet services are delivered.
- A notable development in this realm is the Open Credit Enablement Network (OCEN), a set of standards that signals a significant change in the dynamics of lending and borrowing.
- OCEN is a commendable initiative aimed at **democratising lending operations**, ensuring optimal credit terms for small borrowers in the future.

Key milestones, such as low-cost accessibility through Aadhaar, the success of citizen-centric services like **Unified Payments Interface (UPI)**, widespread adoption and reach (**DigiLocker, MyGov**), and the efficient vaccine journey through **Co-Win**, showcase the success of India's public digital infrastructure evolution.

THE REAL ESTATE ACT 2016

- The Real Estate Act 2016 aims to enhance **transparency and consumer safety** in the real estate market by introducing sector-specific regulatory mechanisms.
- It addresses the asymmetrical relationship between developers and consumers, aiming to prevent abuse of dominance in a sector marked by low consumer satisfaction.
- **Key features include:**
  - **Regulator:** Mandates the establishment of real estate regulatory authorities (RERAs) and appellate tribunals in all states and union territories for timely dispute resolution.
  - **Registration:** Requires mandatory registration of projects exceeding 500 sq. meters or having more than 8 apartments. No advertising, booking, or selling is allowed before obtaining necessary approvals.
  - **Disclosures:** Promoters must publicly disclose project details and timelines, enabling informed decisions by buyers.
  - **Standardization:** Defines key terms, homogenizing industry practices and preventing consumer abuse through biased classifications.
  - **Ring-fencing of Receivables:** Promoters must allocate 70% of project receivables in a separate account, limiting withdrawals for land and construction costs in proportion to project completion.
  - **Project Sanctity:** Promoters cannot alter plans, designs, or specifications without the consent of 2/3 of allottees.
  - **Legal Recourse:** Ensures time-bound resolution of complaints, with provisions for refunding consumers in case of possession delays or breach of agreements.
  - **Penalties:** Imposes monetary penalties and imprisonment up to 3 years for promoters' defaults, and fines or imprisonment up to 1 year for consumers not complying with tribunal orders.

Shortcomings/Criticism of The Real Estate Act

- **Pre-Project Approvals:** The Act mandates obtaining all necessary approvals before project launch, potentially causing delays and limiting the supply of new properties.
- **Penalties for Delays:** While the Act penalizes developers for delays, it doesn't address the issue of slow approvals from government agencies, potentially penalizing developers for factors beyond their control.
- **Black Money Transactions:** The Act does not specifically address the issue of black money in real estate transactions.

Observation: While the Act sets standards and allocates risks in construction projects, it **lacks a single-window clearance mechanism** and fixed timelines for approvals, potentially leading to penalties for genuine delays. Nonetheless, it aims to enhance transparency, accountability, and efficiency in the real estate market, benefiting stakeholders by instilling financial and operational discipline.

SMART CITIES AND AMRUT

Smart City

- In India, a smart city represents a wish list for city dwellers, reflecting their aspirations for infrastructure and services.
  - It is characterized by four pillars: **institutional** (e-governance, law & order, safety), **physical** (public transport, power, water supply), **social** (education, healthcare, housing), and **economic** (job creation, livelihood).
  - A smart city aims to **enhance quality of life, employment, and investment opportunities**.

- All **100 cities participating** in the Smart City Mission have established **Special Purpose Vehicles (SPVs), City Level Advisory Forums (CLAFs),** and engaged **Project Management Consultants (PMCs)**.
- In 2020, the Ministry of Housing and Urban Affairs introduced **two new indices** to evaluate the quality of life for residents in 100 smart cities and 14 other million-plus cities. These indices are:
  - **Ease of Living Index:** designed to evaluate the ease of living for citizens across three pillars: **Quality of Life, Economic Ability, and Sustainability**. For the first time, a Citizen Perception Survey is being conducted as part of the Ease of Living Index Assessment.
  - **Municipal Performance Index:** created to assess the performance of municipalities using five enablers: **service, finance, planning, technology, and governance**.

Smart Cities Funding

- The financing of Smart Cities involves a **Centrally Sponsored Scheme (CSS)**, with contributions from the Central Government matched by States and Urban Local Bodies (ULBs).
- To cover project costs, funds are mobilized from various sources, including user fees, land monetization, loans, and funds transferred through the Fourteenth Finance Commission.
- Innovative finance mechanisms like municipal bonds, borrowings from financial institutions, and private sector participation through Public-Private Partnerships (PPPs) are also employed.
- Smart Cities operate through **Special Purpose Vehicles (SPVs)** at the city level, with a 50:50 equity shareholding between the State/UT and the ULB.
  - To ensure SPV functionality, States/ULBs must provide a dedicated revenue stream, making it self-sustainable, and the government contribution should be used exclusively for infrastructure creation.
  - Project execution may involve joint ventures, subsidiaries, PPPs, turnkey contracts, etc., combined with revenue sources.
- Smart Cities adopt an "area-based development" approach, focusing on city improvement (retrofitting), city renewal (redevelopment), and city extension (greenfield development) in a phased manner.

Smart Cities, Economic and Inclusive Growth

- In India, the urban population currently constitutes 30% (40 crores) of the total population (130 crores) and contributes more than 60% to India's GDP.
- Projections indicate that in the next 15 years, the urban population will reach 60 crores, contributing nearly 75% to the national GDP. Consequently, cities are recognized as pivotal engines of economic growth.
- Smart cities, equipped with enhanced infrastructure and services, become magnets for investments and industries, fostering the agglomeration of economies (benefits obtained by firms locating near each other) and generating employment opportunities.
- These initiatives aim to **transform existing city areas,** including slums, into well-planned spaces, enhancing the overall livability of cities. Simultaneously, new areas around cities will be developed to accommodate the expanding urban population.
- Ownership of houses is linked to increased satisfaction and motivation in life.
- The **"Housing for All"** scheme, with the aim of providing 2 crore houses by 2022 to the poor and marginalized sections, is poised to elevate living standards and contribute to economic growth.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

- AMRUT aims to **enhance basic urban infrastructure services**, including water supply, sewerage and septage management, drainage, pedestrian and non-motorized transport facilities, and the development of green spaces and parks.

IGNITE YOUR MIND

Here is a case study for you to solve! A remote village in the hilly state of Uttarakhand is experiencing high dropout rates among school children due to a lack of proper infrastructure. The village is situated up-hill with no paved roads, making the journey to school difficult, especially during the monsoon season. Imagine you are a District Collector, under whose ambit this village comes. Think of a detailed plan as to how you will tackle the situation, keeping in mind a holistic and community-driven approach coupled with innovative solutions.

- The scheme focuses on **upgrading urban living conditions** through infrastructure improvement.
- Implementation of AMRUT is tied to urban reforms such as e-governance, capacity building, the establishment of a professional municipal cadre, devolution of funds and functions to urban local bodies, building bye-law reviews, improvements in municipal tax assessment and collection, credit rating of urban local bodies, energy and water audits, and citizen-centric urban planning.
- This initiative **lays the groundwork for the growth** of cities into smart cities.
- In AMRUT, states play an equal role in planning and implementing projects, promoting cooperative federalism.
- This **Centrally Sponsored Scheme (CSS)** covers 500 selected cities for upgradation.

The Smart Cities Mission and AMRUT were simultaneously launched and are interconnected. **AMRUT follows a project-based approach,** addressing basic infrastructure services in 500 cities, while the **Smart Cities Mission adopts an area-based development approach** for 100 cities, focusing on core infrastructure with subsequent layers of smartness. AMRUT's project-based strategy concentrates on water supply, sewerage and septage management, stormwater drainage, non-motorized urban transport, and green spaces/parks.

VALUE CAPTURE FINANCE (VCF)

- Over the past two and a half years, the Ministry of Urban Development (MoUD), Government of India, has launched several major missions to enhance urban services and address the urban infrastructure deficit.
- A critical challenge has been the **limited revenues and capacity** of cities. To overcome this, Value Capture Finance (VCF) emerges as an innovative tool for urban development funding and revenue generation.
- VCF operates on the principle that private properties benefit from public infrastructure investments and governmental policy decisions.
- By deploying appropriate VCF tools, a portion of the increased value of land and buildings resulting from government actions can be captured.
  - This captured revenue is then utilized to fund public projects, creating a beneficial cycle of value creation, realization, capture, and reinvestment in projects.

Some VCF Tools/Methods

- **Premium on Relaxation of Rules or Additional FAR (Floor Area Ratio):** Government allows additional development rights beyond permissible limits and charges a fee, providing revenue for further infrastructure development.
- **Land Pooling System:** Private individuals contribute land to the government, which develops public infrastructure. The increased value of private land due to this development serves as a source of revenue, and the remaining developed land is returned to the contributors.
- **Transfer of Development Rights:** This zoning technique conserves land by redirecting development from one area (sending area) to a more suitable and denser development area (receiving area).
- **Fees for Changing Land Use:** The government charges a fee for converting agricultural land for non-agricultural use. This fee contributes to revenue for urban development.

INVITS AND REITS AND NIIF

InvITs and REITs

- InvITs and REITs, registered under the **Indian Trusts Act, 1882 and regulated by SEBI,** manage funds invested in infrastructure and real estate.
- While **InvITs focus on infrastructure** projects, **REITs specialize in real estate** projects.
- Operating similarly, they **function as mutual fund**-like institutions, pooling funds from various individual investors, financial institutions, and companies.
- These investment avenues **eliminate entry barriers for middle-class investors** who traditionally avoid commercial real estate and infrastructure due to high investment sizes. By making real estate accessible, REITs empower middle-class investors.
- InvITs and REITs benefit the infrastructure and real estate industry by enabling developers to sell their properties to these trusts, facilitating the initiation of new projects.
- Investors' funds in InvITs and REITs are diversified across different infrastructure and real estate projects, with these trusts being listed and traded on stock exchanges.
- Certain restrictions, such as the requirement that 80% of InvITs/REITs' asset value should be in revenue-generating projects, ensure a balanced portfolio.
- Regular revenue from rentals, tolls, or project asset sales is returned to investors as dividends by InvITs and REITs.

National Investment and Infrastructure Fund (NIIF)

- Established in 2015, the National Investment and Infrastructure Fund (NIIF) aims to **attract investment from domestic and international sources** for funding commercially viable projects in the infrastructure sector.
- Headquarter is in Mumbai.
- As a trust registered under **SEBI's Category II of Alternative Investment Fund** for tax benefits, NIIF is structured as a quasi-sovereign wealth fund, with the government holding 49% ownership.
  - Funds for NIIF come from overseas sovereign, quasi-sovereign, multilateral, bilateral investors through equity, and domestic sources like cash-rich central PSUs, provident funds, and insurance funds.
  - Market borrowings (debt) are also part of the funding sources.
- NIIF's investments focus on both **equity and debt** in infrastructure projects, and it extends to equity investments in **Non-Banking Financial Companies (NBFCs)** and **Financial Institutions (FIs)** involved in infrastructure financing.

In March 2020, the **Asian Development Bank (ADB)** committed to investing $100 million in the Fund of Funds component of NIIF. Additionally, in 2018, the **Asian Infrastructure Investment Bank (AIIB)** pledged $200 million for NIIF.

- NIIF currently manages over $4 billion in capital commitments through three funds:
  - **Master Fund:** Invests in operating assets in core infrastructure sectors such as roads, ports, airports, and power.

- **Fund of Funds:** Invests through third-party fund managers.
- **Strategic Fund:** Registered as an Alternative Investment Fund II under SEBI, with a focus on investing in equity and equity-linked instruments.

NATIONAL INFRASTRUCTURE PIPELINE (NIP)

- The National Infrastructure Pipeline (NIP) for FY 2020-25 is a pioneering initiative aimed at delivering world-class infrastructure, enhancing citizens' quality of life.
- Envisioning the infrastructure goals for the period FY 2020-25, NIP focuses on improving project preparation and attracting investments.
- **Formed by an Inter-ministerial Task Force** in September 2019, the NIP report was released in December 2019.
- Anticipated benefits of NIP include well-prepared infrastructure projects generating employment, enhancing living standards, and ensuring equitable infrastructure access for all.

National Infrastructure Pipeline (2020-25)

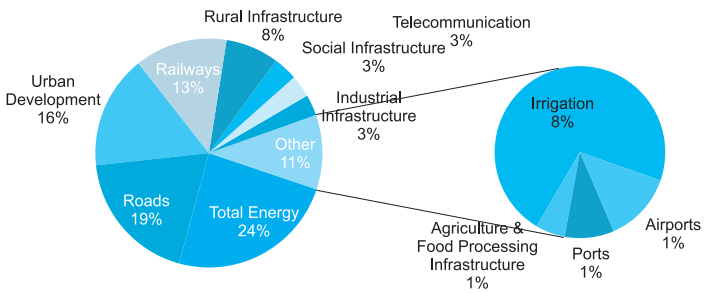


Fig. 17.16: National Infrastructure Pipeline

- The initiative aims to **stimulate supply-side interventions, fostering short-term and potential GDP growth**. Enhanced infrastructure capacities are expected to boost India's economic competitiveness.
- The NIP outlines a total projected infrastructure investment of ₹ 102 lakh crores during FY 2020-25, with Energy (24%), Roads (19%), Urban (16%), and Railways (13%) collectively constituting over 70% of the capital expenditure.
- Funding distribution is anticipated to be shared equally between the Central Government (39%) and State Government (39%), with the Private Sector contributing (22%).
- The Task Force recommendations include essential changes to sectoral policies and reform initiatives by both Central and State Governments. These encompass developing a robust bond market for infrastructure firms, expeditious resolution of infrastructure disputes, ensuring balanced PPP contracts for optimal risk-sharing, and upholding the sanctity and enforceability of contracts.

Benefits

- **Economic Engine:** NIP estimates 1-2% GDP growth, attracting investments and creating millions of jobs.
- **Connectivity Revolution:** Improved infrastructure reduces logistics costs, speeds up delivery, and enhances trade competitiveness.
- **Quality of Life Boost:** Modern infrastructure improves access to healthcare, education, and sanitation, enhancing lives.
- **Global Gateway:** Efficient infrastructure attracts foreign investments and positions India as a global economic powerhouse.

Challenges

- **Execution Hurdles:** Streamlining land acquisition, coordinating agencies, and overcoming bureaucratic roadblocks.
- **Financing Needs:** Attracting private sector investments and ensuring public funding to bridge the resource gap.
- **Sustainability Imperative:** Balancing development with environmental concerns, adopting clean technologies, and responsible resource management.
- **Inclusive Growth:** Prioritizing projects for underserved areas and marginalized communities.

Way Forward

- **Public-Private Partnerships:** Innovative financing models and risk-sharing mechanisms to attract private investments.
- **Tech-Driven Efficiency:** Leveraging digital tools for project monitoring, data analysis, and communication.
- **Green Infrastructure:** Embedding sustainability principles, adopting clean technologies, and minimizing environmental impact.
- **Community Engagement:** Proactive collaboration with local communities, addressing concerns, and ensuring equitable benefits.

NIP's success lies in effective execution, sustainable practices, and inclusive development, laying the foundation for a vibrant, equitable, and globally competitive India.

Global Infrastructure Facility (GIF)

- Launched by the World Bank in 2014, the Global Infrastructure Facility (GIF) is a global platform that facilitates the preparation and structuring of complex infrastructure Public-Private Partnerships (PPPs). It aims to mobilise private sector and institutional investor capital by coordinating efforts among Multilateral Development Banks (MDBs), private sector investors, and governments interested in infrastructure investment in Emerging Markets and Developing Economies (EMDEs).

- Key principles of GIF include providing public goods, mobilising the private sector, achieving value for money, promoting sustainability and inclusiveness, and complementing partner efforts by supplementing existing resources.
- GIF supports governments in designing, preparing, structuring, and implementing transactions for well-structured and bankable infrastructure projects.
- In India, two GIF-supported projects have been initiated: the Solar PPP Program for the development of solar parks under the Ministry of New and Renewable Energy and the Rajasthan State Highways Development Project.

NATIONAL MONETIZATION PIPELINE (NMP)

- The National Monetization Pipeline (NMP), launched by the Government on August 23, 2021, aims to **finance the National Infrastructure Pipeline (NIP)** by unlocking the value of underutilized or unutilized public assets.
- This monetization initiative spans four years, from FY 2021-22 to FY 2024-25, aligning with the NIP's timeline.
- Key features of the NMP include estimating a monetization potential of ₹ 6.0 lakh crores from core assets of the Central Government and Central Public Sector Enterprises.
- Sectors covered under NMP comprise **roads, ports, airports, railways, warehousing, gas & product pipelines, power generation and transmission, mining, telecom, stadiums, hospitality, and housing**.
- Around 14% of the Central Government's NIP outlay will be funded through NMP, amounting to ₹ 43 lakh crores.
- Developed by NITI Aayog in consultation with infrastructure ministries, the strategic objective is to **unlock brownfield** public sector asset value, leveraging institutional and long-term capital.
- The monetization modality involves **structured contractual agreements** (PPP agreements/concessions) and the **use of Infrastructure Investment Trusts (InvITs)**, with assets reverting to the government at the contract's end.
- The NMP **focuses on de-risked brownfield assets**, excluding disinvestment and monetization of non-core assets.
- Viewed as more than a funding mechanism, asset monetization represents a paradigm shift in infrastructure operations, emphasizing private sector resource efficiencies and adaptability.
- The end goal is **collaborative infrastructure creation** through monetization, enhancing socio-economic growth and citizens' quality of life.
- Real-time monitoring is facilitated through the asset monetization dashboard.

Challenges of NMP

- Lack of identifiable revenue streams in various assets.
- Level of capacity utilization in gas and petroleum pipeline networks.
- Dispute resolution mechanism.
- Regulated tariffs in power sector assets.
- Low investor interest in National Highways below four lanes.

Examples of Asset Monetization

- Providing a PSU/Government-owned asset, like the **Dedicated Freight Corridor**, to a Private Operator for Operation and Maintenance in exchange for a one-time payment over a specified contract period (for example 30 years).
- Transferring already constructed NHAI roads to Private Parties on a **Toll Operate Transfer (TOT) model** for a designated period in exchange for a lump sum payment.
- **Leasing Airports to Private Operators** for a specified duration in return for a lump sum payment.
- Entrusting Transmission Assets of PGCIL and Oil & Gas pipelines of GAIL, IOCL, HPCL to private operators for a lump sum payment over a contracted period.

Note: Contrary to misconceptions, it's important to note that the monetization of infrastructure assets does not necessarily lead to increased tariffs. Tariffs are regulated and capped with inflation as specified in the concession or agreement itself.

NATIONAL LOGISTICS POLICY 2022

- The National Logistics Policy envisions a technologically enabled, integrated, cost-efficient, resilient, sustainable, and trusted logistics ecosystem in India for accelerated and inclusive growth.
- Key objectives include **reducing logistics costs**, aiming for a top 25 ranking in the **Logistics Performance Index** by 2030, and establishing a **data-driven decision support mechanism**.

Implementation

- **Comprehensive Logistics Action Plan (CLAP):** The policy will be executed through CLAP, focusing on eight key action areas:
- Integrated Digital Logistics Systems
- Standardization of physical assets and benchmarking service quality
- Logistics Human Resources Development and Capacity Building

- State Engagement
- EXIM (Export-Import) Logistics
- Service Improvement framework
- Sectoral Plan for Efficient Logistics
- Facilitation of Development of Logistics Parks

Benefits

- **Cost Reduction:** Aiming to reduce logistics costs in India to global benchmarks (single digit) by 2030.
- **Global Ranking:** Aspiring to be among the top 25 countries in the Logistics Performance Index by 2030.
- **Data-Driven Decision Support:** Establishing a mechanism for efficient logistics decision-making.

Impact

- **International Trade Boost:** Facilitating international trade and contributing to India's self-reliance.
- **Agricultural Impact:** Benefiting farmers by enabling faster transportation, reducing wastage, and lowering prices.

Integration with Gati Shakti

- Aligns with PM Gati Shakti National Master Plan, providing a comprehensive agenda for the development of the entire logistics ecosystem.

Unified Logistics Interface Platform (ULIP)

- ULIP, an integrated portal, centralizes information about the real-time location of goods, streamlining digital services in the transport sector.

The National Logistics Policy, coupled with PM Gati Shakti, aims to transform India's logistics landscape, fostering economic growth, self-reliance, and opportunities for startups while benefiting farmers and facilitating international trade.

Logistics Performance Index

The Logistics Performance Index (LPI) is an interactive benchmarking tool **created by the World Bank** that evaluates the efficiency of a country's logistics and trade facilitation processes. It provides insights into how well a country's logistics performance supports its overall trade and supply chain activities.

India has advanced six positions in the World Bank's Logistic Performance Index (LPI) 2023, currently securing the **38th spot among 139 countries**. This marks a notable improvement from its 2018 ranking of 44th and the 2014 ranking of 54th. Singapore has overtaken Germany as the world logistics champion in the Logistics Performance Index (LPI) 2023.

LPI 2023 measures **trade speed** for the first time using indicators obtained from extensive datasets that monitor shipments.

Fig. 17.17: Parameters

LEADS (Logistics Ease Across Different States)

LEADS is an **annual exercise** initiated in 2018, inspired by the Logistics Performance Index (LPI) of the World Bank. Unlike the LPI, which relies solely on perception-based surveys, LEADS incorporates both **perception and objectivity**, enhancing the robustness and comprehensiveness of the assessment.

The LEADS 2023 report, representing its 5th edition, offers insights into the improvement of logistics performance at the State/UT level. It emphasizes the positive shift in States' performance across key pillars: **Logistics Infrastructure, Logistics Services, and Operating and Regulatory Environment**. The report aims to empower State/UT Governments with region-specific insights for informed decision-making and comprehensive growth.

Key Points from LEADS 2023

Coastal Group:

- **Achievers:** Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu
- **Fast Movers:** Kerala, Maharashtra
- **Aspirers:** Goa, Odisha, West Bengal

Landlocked Group:

- **Achievers:** Haryana, Punjab, Telangana, Uttar Pradesh
- **Fast Movers:** Madhya Pradesh, Rajasthan, Uttarakhand
- **Aspirers:** Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand

North-East Group:

- **Achievers:** Assam, Sikkim, Tripura
- **Fast Movers:** Arunachal Pradesh, Nagaland
- **Aspirers:** Manipur, Meghalaya, Mizoram

Union Territories:

- **Achievers:** Chandigarh, Delhi
- **Fast Movers:** Andaman & Nicobar, Lakshadweep, Puducherry
- **Aspirers:** Daman & Diu/Dadra & Nagar Haveli, Jammu & Kashmir, Ladakh

The report is based on a **pan-India primary survey** encompassing over 7,300 responses across 36 States/UTs. Additionally, more than 750 stakeholder consultations, facilitated by National, Regional, and State Associations, significantly contributed to this comprehensive evaluation.

IGNITE YOUR MIND

Our present models of infrastructure are inaccessible for people with different abilities, impeding their ability to navigate and participate fully in various aspects of public life. How can we make use of advancement in assistive technologies, collaborate with differently abled communities and incorporate universal design principles to create infrastructure that is inclusive and accessible to all?

VARIOUS COMMITTEES ON INFRASTRUCTURE

Kelkar Committee on Revisiting & Revitalizing the PPP Model of Infrastructure Development

- In the fiscal year 2015-16 Union Budget, Finance Minister Shri Arun Jaitley declared the necessity to reevaluate and reinvigorate the Public-Private Partnership (PPP) mode of infrastructure development. In alignment with this declaration, a committee was established to revisit and revitalize the PPP model of infrastructure development, with **Dr. Vijay Kelkar** serving as its chairperson.
- **Report Highlights:**
  - Public Private Partnerships (PPPs) involve a private partner undertaking a public asset and service, granted the concession for a specified time, based on market-derived revenue streams.
  - PPPs are crucial for accelerating infrastructure development in India, tapping into global pension funds, and supporting rapid growth.
  - India has become the world's largest PPP market, requiring periodic reviews to address emerging challenges and opportunities.
  - Attitude and mindset changes are essential for the success of PPPs, involving public agencies, government departments, and oversight institutions.
  - **Urgent amendments to the Prevention of Corruption Act** are recommended to distinguish malafide actions from genuine errors in decision-making.
  - Strengthening PPP frameworks' governance, institutions, and capacity is crucial for future implementation.
  - The establishment of an **independent regulator** with a unified mandate for various infrastructure sub-sectors is critical.
  - The Committee emphasizes the need for time limits on arbitration hearings, efficient risk allocation, and protection against **"Obsolescing Bargain."**
  - Distressed PPP projects require a mechanism to address "actionable stress," and sector-specific institutional frameworks should be developed.
  - A robust **dispute resolution mechanism**, legal frameworks for new project proposals, and careful consideration of PPP for small projects are recommended.
  - Unsolicited proposals **("Swiss Challenge")** should be discouraged for transparency and fair treatment in the procurement process.
  - State-owned entities (SoEs/PSUs) should be restricted from bidding for PPP projects, and PPPs should not be used as off-balance sheet funding.
  - Comprehensive guidelines on government audit of private partners' books are recommended to ensure transparency and governance.
  - Monetization of viable projects, divestment of equity in successful projects, and exploration of long-term capital options are suggested.
  - The issuance of **Deep Discount Bonds or Zero Coupon Bonds** is encouraged to lower debt servicing costs and enable lower user charges.
  - The Committee recommends developing a **national PPP Policy document**, possibly enacted as a law, to provide a clear framework.
  - The report stresses the urgency of accelerating growth due to India's demographic transition and the need for maturity and sophistication in PPP models.

Committee on National Highways Development Program (NHDP)

- **Objective:** To assess and enhance the effectiveness of the National Highways Development Program.
- **Chaired by:** Nandan Nilekani.
- **Key Recommendations:** Focused on leveraging technology for effective project monitoring and enhancing the efficiency of the highway development program.

Committee on Infrastructure Financing

- **Objective:** To explore financing options for the infrastructure sector.

- **Chaired by:** Deepak Parekh.
- **Key Recommendations:** Explored diverse financing mechanisms, including the involvement of institutional investors and addressing challenges in infrastructure financing.

Committee on Integrated Development of Power, Coal, and Renewable Energy

- **Objective:** To suggest measures for integrated development in the power, coal, and renewable energy sectors.
- **Chaired by:** Suresh Prabhu.
- **Key Recommendations:** Focused on optimizing resources, promoting renewable energy, and ensuring the synergy of policies in the power and energy sectors.

Committee on Road Safety

- **Objective:** To address road safety issues in India.
- **Chaired by:** K.S. Radhakrishnan
- **Key Recommendations:** Emphasized measures to improve road safety, reduce accidents, and enhance traffic management.

Committee on Port Connectivity

- **Objective:** To enhance connectivity between ports and the hinterland.
- **Chaired by:** Bibek Debroy.
- **Key Recommendations:** Focused on improving infrastructure to facilitate the smooth movement of goods between ports and inland areas.

Committee on Railways Restructuring and Reorganisation

- **Objective:** To recommend measures for restructuring and reorganizing the Indian Railways.
- **Chaired by:** Bibek Debroy.
- **Key Recommendations:** Proposed reforms in railway operations, including the creation of separate entities for distinct functions.

Committee on Digital Payments

- **Objective:** To explore and promote digital payment solutions in the transportation sector.
- **Chaired by:** Nandan Nilekani.
- **Key Recommendations:** Focused on leveraging digital technologies for seamless and efficient payment systems in transportation.

LAND POOLING VS LAND ACQUISITION

Land pooling and land acquisition are two distinct approaches to acquiring land for development purposes.

Land Pooling	Land Acquisition
Voluntary Participation: • **Landowners Participation:** In land pooling, landowners voluntarily come forward to contribute their land for development. **Redistribution of Developed Land:** • **Return to Landowners:** Instead of monetary compensation, landowners receive a portion of the developed land. The remaining land is used for infrastructure development. **Development by Private Entities:** • **Private Developers:** Private entities or real estate developers typically manage the development process. **Participatory Planning:** • **Collaborative Planning:** The planning process involves collaboration between landowners, developers, and local authorities to create a cohesive development plan. **Infrastructure Development:** • **Shared Responsibility:** Infrastructure development, such as roads and utilities, is a shared responsibility between landowners and developers. **Community Engagement:** • **Local Involvement:** Land pooling often involves a higher level of community engagement and consultation.	**Compulsory Takeover:** • **Government Authority:** Land acquisition is a compulsory process where the government acquires land, often for public projects. **Monetary Compensation:** • **Compensation Package:** Landowners receive monetary compensation based on market rates, rehabilitation, and other benefits. **Government-Led Development:** • **Public Projects:** The government typically takes the lead in executing development projects after acquiring the land. **Centralised Planning:** • **Government Planning:** Development plans are often centrally planned by government authorities without direct involvement from landowners. **Infrastructure by Government:** • **Government Responsibility:** The responsibility for infrastructure development lies primarily with the government. **Limited Community Involvement:** • **Less Consultation:** There may be limited community involvement or consultation in the decision-making process.

Each approach has its advantages and challenges, and the choice between land pooling and land acquisition often depends on the specific context, legal framework, and the goals of the development project.

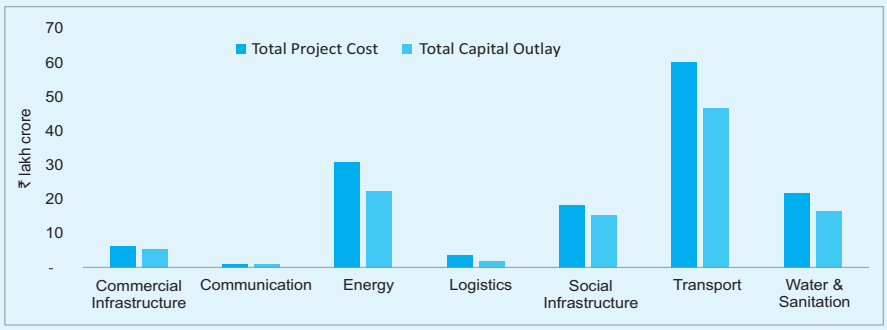
Economic Survey 2022-23: Government Infrastructure Highlights

Public Private Partnerships (PPP)

- In-Principal Approval for 56 projects with a Total Project Cost of ₹ 57,870.1 crore under the VGF Scheme.
- Introduction of the IIPDF Scheme with a ₹ 150 crore outlay from FY 23-25.

National Infrastructure Pipeline (NIP)

- 89,151 projects with a cost of ₹ 141.4 lakh crore at various implementation stages.
- Completion of 1009 projects worth ₹ 5.5 lakh crore.
- NIP and Project Monitoring Group (PMG) portal linkage for accelerated project approvals.



Source: Department of Economic Affairs.

Fig. 17.18: Transportation sector dominates the NIP

National Monetisation Pipeline (NMP)

- Estimated cumulative investment potential of ₹ 9.0 lakh crore.
- Achieved ₹ 0.9 lakh crore monetisation target in FY22.
- FY23 target set at ₹ 1.6 lakh crore (27% of overall NMP Target).

GatiShakti - National Master Plan

- Comprehensive database for integrated planning and synchronized implementation.
- Focus on improving multimodal connectivity and logistics efficiency.

Electricity Sector and Renewables

- Sanctioned 40 GW capacity for solar parks in 16 states.
- 17.2 lakh GWh electricity generated in FY22.
- Total installed power capacity increased from 460.7 GW (March 2021) to 482.2 GW (March 2022).

Making Indian Logistics Globally Competitive

- **National Logistics Policy:** Aims for a technologically enabled, integrated, cost-efficient, resilient, sustainable, and trusted logistics ecosystem.
- **National Highways/Roads Construction:** Witnessed a rapid increase with 10,457 km constructed in FY22 (vs. 6,061 km in FY16).
- **Budget Expenditure:** Increased from ₹ 1.4 lakh crore (FY20) to ₹ 2.4 lakh crore (FY23), emphasising capital expenditure.
- **Kisan Rails:** 2,359 Kisan rails transported around 7.91 lakh tonnes of perishables as of October 2022.
- **UDAN Scheme:** Over one crore air passengers benefited from the UDAN scheme since its inception in 2016.
- **Capacity of Major Ports:** Capacity of major ports nearly doubled in eight years.
- **Inland Vessels Act 2021:** Replaced a 100-year-old Act to ensure hassle-free movement of vessels, promoting inland water transport.

India's Digital Public Infrastructure

- Unified Payment Interface (UPI)
- Transaction growth of 121% in value and 115% in volume (2019-22), paving the way for international adoption.
- **Telephone and Radio for Digital Empowerment**
  - **Total telephone subscribers:** 117.8 crore (as of Sept '22), with 44.3% in rural areas.
  - Over 98% connected wirelessly.
  - **Tele-density:** 84.8% (March '22).
  - 200% increase in rural internet subscriptions (2015-2021).

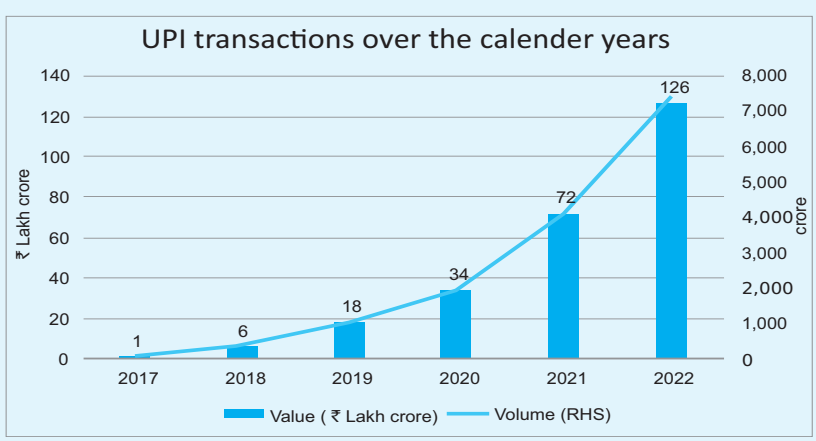


Fig. 17.19: UPI transactions over the calender years

- **Prasar Bharati:** Broadcasts in 23 languages, 179 dialects, reaching 92% of the area and 99.1% of the total population.
- **Digital Public Goods**
  - Aadhaar (since 2009) ensures low-cost accessibility.
  - Government schemes **(MyScheme, TrEDS, GEM, e-NAM, UMANG)** transform the marketplace.
  - Account Aggregator facilitates consent-based data sharing across 110 crore bank accounts.
  - **Open Credit Enablement Network** aims to democratise lending operations.
  - The **National AI portal** publishes content for overcoming language barriers.
- **Data Governance Legislation:** Introduction of legislation for enhanced user privacy and fostering an ecosystem for standard, open, and interoperable protocols.

Social Infrastructure and Employment: Big Tent

- **Government Spending**
  - Health sector expenditure: 2.1% of GDP in FY23 (BE), up from 1.6% in FY21.
  - Social sector spending rises to ₹ 21.3 lakh crore in FY23 (BE) from ₹ 9.1 lakh crore in FY16.
- **Poverty Alleviation: UNDP's Multidimensional Poverty Index:** 41.5 crore people exit poverty in India (2005-06 to 2019-20).
- **Aspirational Districts Programme:** Template for good governance, especially in remote and difficult areas.
- **eShram Portal:** Registers over 28.5 crore unorganized workers for a National database.
- **JAM Trinity and DBT:** Inclusion of marginalized sections in the formal financial system.
- **Aadhaar's Impact:** Integral to **Co-WIN platform** for transparent administration of 2 billion vaccine doses.
- **Labour Market Recovery:** Unemployment rates fall from 5.8% in 2018-19 to 4.2% in 2020-21.
- **Education:** Improvement in **Gross Enrolment Ratios (GER)** in schools and gender parity in FY22.
- **Health Expenditure and Outcomes**
  - Out-of-pocket expenditure declines from 64.2% (FY14) to 48.2% (FY19).
  - Decline in **Infant Mortality Rate (IMR)**, **Under Five Mortality Rate (U5MR)**, and **Neonatal Mortality Rate (NMR)**.
- **COVID-19 Vaccination and Ayushman Bharat Scheme**
  - Over 220 crore COVID vaccine doses administered.
  - Verification of nearly 22 crore beneficiaries under the Ayushman Bharat Scheme with 1.54 lakh operationalized Health and Wellness Centres.

CONCLUSION

Infrastructure is vital for economic development, improving the quality of life, and fostering sustainable progress. It is a fundamental component for achieving a $5 trillion economy. In sum, the synergy between physical and digital infrastructure will be one of the defining features of India's future growth story.

Investment Model

18

INTRODUCTION

Investment

Investing, broadly, is putting money to work for a while in some sort of project or undertaking to generate positive returns (i.e., profits that exceed the amount of the initial investment). It is the act of allocating resources, usually capital (i.e., money), with the expectation of generating an income, profit, or gains.

INVESTMENT MODELS

Investment models are frameworks or strategies guiding how individuals or organizations allocate funds for income, profit, or gains. Investment models are essential to the financial industry because they offer structured frameworks for analyzing and deciding how best to allocate capital. For investors, financial analysts, and fund managers looking to **balance risk and maximize returns,** these models are vital resources.

Infrastructure in The Economy can be Built by Following Three Models

- **Complete Government Model:** This type of project is financed by the government, construction is also done by the government, and after completion, the overall maintenance also lies with the government. So, in this model, the overall responsibility of the project lies with the government, but the government may outsource some of the tasks.
- **Complete Private Model:** In these projects, the construction, finances, and maintenance are under the overall responsibility of the private players, but the government can supervise the project to enforce the laws of the land.
- **PPP (Public-private Partnership):** A public-private partnership, or PPP, is an agreement between a private sector company and a government body to jointly design, finance, build, and run public infrastructure projects or services. In a PPP, the public and private sectors share duties and risks to utilize each other's advantages to provide effective and efficient public services.

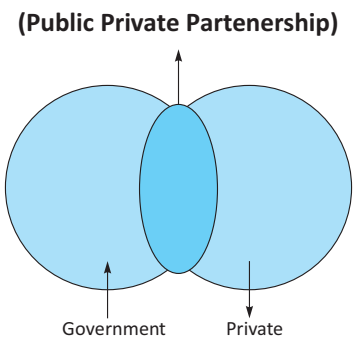


Fig. 18.1

Need for PPP

- **Infrastructure Development:** PPPs are instrumental in developing critical infrastructure projects such as roads, bridges, airports, and ports.
- **Resource Mobilization:** PPPs make it possible to raise private funding for significant projects. Since public budgets are frequently limited, private investment is necessary to finance large-scale infrastructure projects.
- **Innovation and Efficiency:** Involving the private sector promotes efficiency and creativity in project execution. Private sector businesses frequently provide knowledge, technology, and management techniques that improve project delivery speed and quality.
- **Risk Sharing:** Risk sharing between the public and private sectors is made possible via PPPs. Risks related to construction, operations, and finances are frequently assumed by the private sector, which helps relieve pressure on the public sector.
- **Job Creation:** Public-private partnerships support the creation of jobs both directly during the building and operation stages and indirectly through the economic activity that better infrastructure stimulates.
- **Capacity Building:** Working together with the private sector helps government agencies expand their capacity and transmit expertise. This improves overall governance, project execution, and planning.
- **Accelerating Service delivery:** PPPs can speed up the delivery of public services, guaranteeing that the general public has timely access to necessary infrastructure and utilities, which had been a cause of concern in the recent past.

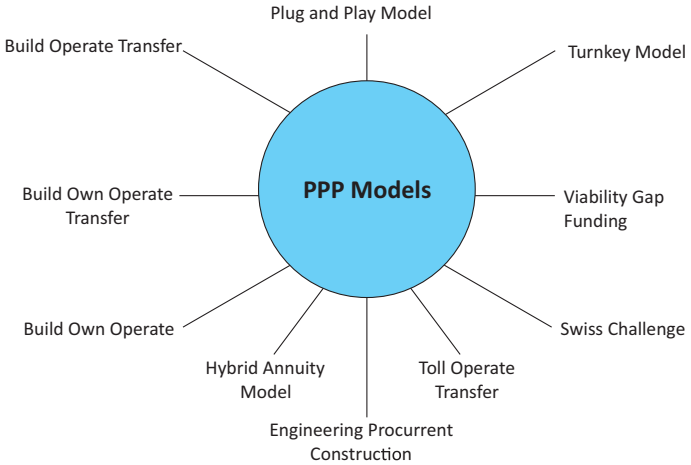


Fig. 18.2: Different PPP Models

So, different PPP models have emerged, each of which offers a distinctive method for utilizing the advantages of both industries for long-term growth and benefit to both parties.

Here are a few typical PPP models:

Build Operate Transfer (BOT)

- **Definition:** Build-Operate-Transfer (BOT) is a Public-Private Partnership (PPP) model where a private company finances, builds, operates, and maintains a public infrastructure project for a specified period. After this period, ownership and control are transferred back to the government.
- **Benefits:**
  - **Promotes private sector participation:** BOT encourages private investment in infrastructure projects, providing much-needed funding.
  - **Boosts efficiency:** Private companies are often more efficient than public entities in project management and operation.
  - **Reduces government burden:** BOT shifts project risks and financial responsibility to the private sector, relieving pressure on government budgets.
- **Examples of successful BOT projects in India:**
  - **Yamuna Expressway:** A 165 km expressway connecting Noida to Agra, built and operated by a private consortium.
  - **Kempegowda International Airport, Bangalore:** A successful example of a public-private partnership in airport infrastructure.

Build Own Operate Transfer (BOOT)

- The Build-Own-Operate-Transfer (BOOT) model is a popular public-private partnership (PPP) arrangement for infrastructure development. In this model, a private entity takes responsibility for the entire lifecycle of a public infrastructure project:
  - **Financing:** The private entity raises funds to finance the project's construction.
  - **Construction:** The private entity builds the infrastructure to the required specifications.
  - **Ownership:** The private entity owns the infrastructure asset for a predetermined concession period.
  - **Operation:** The private entity operates and maintains the infrastructure, generating revenue through user fees or other means.
  - **Transfer:** At the end of the concession period, ownership of the infrastructure is transferred back to the public sector.

Benefits of the BOOT Model

- **Increases private sector participation:** BOOT encourages private investment in infrastructure projects, addressing the funding gap faced by many governments.
- **Improves efficiency:** Private entities often have expertise and experience in project management and operation, leading to efficient construction and operation of the infrastructure.
- **Reduces government burden:** BOOT transfers the financial risks and responsibilities associated with project development and operation to the private sector, freeing up government resources for other priorities.

Examples of Successful BOOT Projects in India

- **Chennai International Airport:** Built and operated by a consortium of private companies, this airport is a major gateway to South India.
- **Mumbai-Pune Expressway:** This high-speed toll highway connecting Mumbai and Pune was built and operated under a BOOT model, significantly reducing travel time between the two cities.

Build Own Operate (BOO)

- The Build-Own-Operate (BOO) model involves a **private entity financing, constructing, and operating** a public infrastructure project, maintaining ownership for an extended or indefinite period. The private entity recovers its investment and operational costs through generated revenue, making it a long-term ownership arrangement that aims to leverage private sector efficiency in infrastructure development.

  Recent Build-Own-Operate (BOO) projects in India include the **Mundra Ultra Mega Power Plant** in Gujarat, developed by Adani Power.

Hybrid Annuity Model

- In an effort to share risks and promote private sector involvement in infrastructure development, HAM **incorporates components of the BOT (Build-Operate-Transfer) and EPC (Engineering, Procurement, and Construction) models.**
- The Hybrid Annuity Model (HAM) is a public-private partnership model that is commonly employed in infrastructure projects in India, particularly in the road sector. In HAM, the government and the private sector split the project's overall cost. The government contributes **40% of the project cost as a lump sum during the construction phase and the remaining 60% as annuity payments over the concession period,** and the private company handles the construction and maintenance.
- Several road projects in India have been executed under the Hybrid Annuity Model, like the **Delhi-Meerut Expressway, Mumbai-Goa Highway widening project, Lucknow Ayodhya Expressway,** etc.

Toll Operate Transfer (TOT)

- Under the Toll-Operate-Transfer (TOT) model, a private company is permitted by the government to run an existing toll road and collect tolls for a pre-determined

amount of period. During the concession time, a private operator collects tolls and maintains the road; after the conclusion of the concession, the government regains ownership of the route. In addition to giving the government upfront cash, TOT seeks to entice private investment for effective toll road administration.

- The Toll-Operate-Transfer (TOT) model has been implemented in projects such as the **Gurugram-Faridabad Toll Road** in Haryana and certain sections of the **Chennai Outer Ring Road** in India.

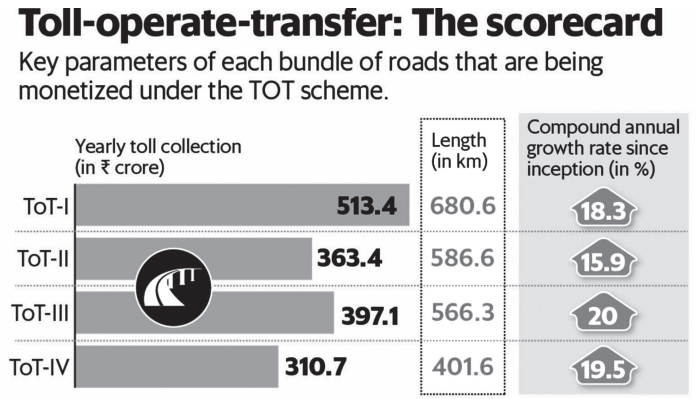


Fig. 18.3: The Scorecard of TOT Model

Engineering, Procurement, and Construction (EPC)

- In an EPC as PPP scenario, a commercial partner and the government or other public entity work together, utilizing the EPC paradigm. The project's engineering, procurement, and construction are the private partner's responsibilities. This kind of cooperation frequently entails a contract in which the commercial party takes on certain project delivery risks.
  - By using the EPC as a PPP strategy, the public sector can keep public ownership or control over the infrastructure while utilizing the efficiency of the private sector in project execution. It is especially important when the government wants to retain long-term ownership and operation but wants to use private expertise for building and project management.
  - The EPC as a PPP concept has been used in a number of international infrastructure projects in recent years. The development of **metro rail systems in cities like Pune and Mumbai** serves as an instructive example. Additionally, highway development projects supervised by the **National Highways Authority of India (NHAI)** sometimes feature private participation, combining EPC concepts for construction, maintenance, and toll collection.
- **Swiss Challenge:** The Swiss Challenge is a competitive bidding process used in public procurement and project development. In this method, if a project is proposed to the government or project owner by a private entity, third parties are welcome to submit competitive offers in lieu of the customary bidding procedure. The initial proponent is entitled to match or exceed the best offer made by the rival parties.
  - The objective of this approach is to promote fair competition, innovation, and transparency in project development and public procurement. In 2017, 23 railway stations were renovated using the SCM by **Indian Railways**, **Mega Film City Venture by the Jaipur Development Authority, and the Thane housing project by the Maharashtra Housing and Area Development Authority** were developed using the SCM.
- **Viability Gap Funding:** Viability Gap Funding (VGF) is the process through which the government or another public entity contributes money to a project in order to make it profitable for private investors. There may be a discrepancy between project costs and anticipated earnings in PPP projects, where the private sector participates in infrastructure construction.

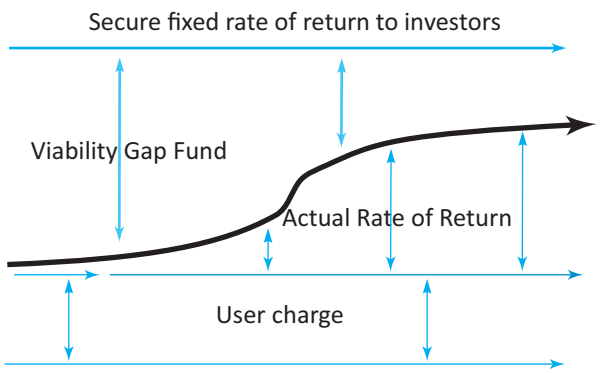


Fig. 18.4: Working of VGF

  - By adding to project funding, VGF closes this financial gap and promotes private investment in projects that might not otherwise be feasible.
  - Recently, the private sector's involvement in India's infrastructure development has been greatly aided by Viability Gap Funding (VGF). Applications in highway projects, especially those overseen by the **National Highways Authority of India (NHAI)**, are noteworthy examples. For **toll road projects**, where user fees alone may not be sufficient to ensure economic viability, VGF has played a crucial role in luring private investment.
  - VGF has also been used in the field of **renewable energy,** providing financing for projects such as **solar power parks. UDAN** is a prominent example of VGF in building aviation infrastructure.

PLUG and PLAY Model

- The "Plug and Play" model is a simplified, readily implementable strategy for including the private sector in infrastructure projects. Through this model, the government aims to reduce obstacles for private investors by offering ready-made, pre-structured projects.

- Offering initiatives that have defined frameworks, regulatory clearances, risk allocations, and investor readiness is part of this strategy. The objective is to quickly draw in private investment, which will facilitate the easier and more effective involvement of private organizations in PPP.

Turnkey Model

- A turnkey Public-Private Partnership (PPP) involves the complete handoff of designing, building, and frequently maintaining a public infrastructure project to a private organization. Under this arrangement, the private partner oversees the entire project life cycle, providing a single point of contact.
- After completion, the government receives a ready-to-use asset by making payment to the private partner while the private sector assumes the associated risks. Turnkey PPPs are particularly common in **infrastructure projects** where:
  - The government seeks to transfer risks and responsibilities to the private sector.
  - The government wants the expertise and efficiency of private entities in project execution.

  For instance, a turnkey contract would be utilized to develop skyscrapers, office complexes, malls, and airports, as can be seen in **Jewar Airport** where **Zurich Airport International** is responsible for construction.

Significance of PPP Model

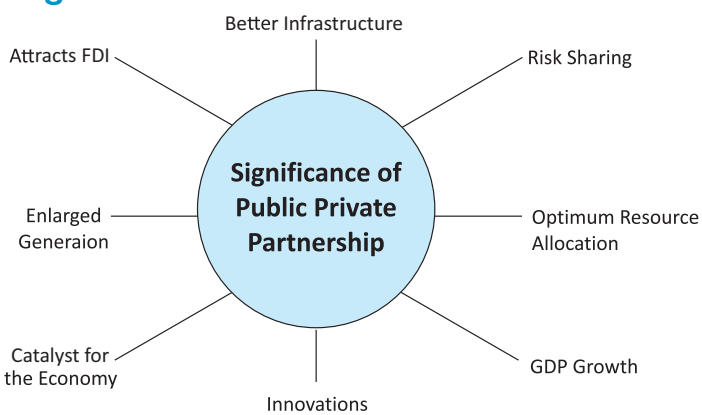


Fig. 18.5: Significance of PPP

Right Model for India

The "right" investment model for India will vary depending on several criteria, such as:

- Type of particular industry,
- Nature of the project,
- Level of risk tolerance and holistic risk sharing arrangement
- General economic conditions
- Management of Finance
- Compatibility with regional and national development goals

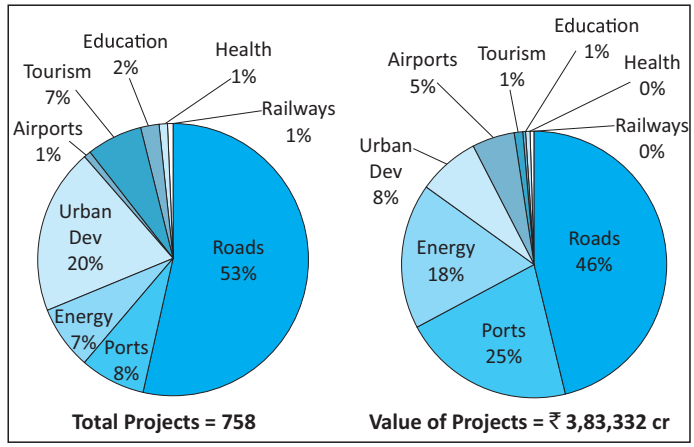


Fig. 18.6: Sector-wise PPP Projects

So, after taking into consideration all these factors, India uses a variety of investment strategies in various industries, as mentioned above. Furthermore, **regulatory frameworks and policies** have a significant impact on how appealing investment models are. In order to create models that balance risk and reward and promote sustainable economic development, investors and policymakers should work together, taking into consideration all the stakeholders involved.

Public-Private Partnerships: Fueling Innovation in India's HRD Landscape

Revolutionizing Education and Skill Development

- **Shifting Paradigm:** Public-Private Partnerships (PPPs) are fundamentally transforming the Indian education and skill development landscape. They combine the strengths of public sector commitment with private sector efficiency and innovation, leading to:
  - **Improved Education:** PPPs enhance educational infrastructure, curriculum development, and teacher training, leading to higher-quality learning experiences.
  - **Enhanced Training:** They are expanding training programs to cater to diverse needs and skill gaps, ensuring better alignment with industry demands.
  - **Effective Skill Development:** By bridging the gap between education and industry requirements, PPPs are equipping individuals with market-relevant skills, boosting employability.

Success Stories Demonstrating Impact

- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY):** An NSDC initiative, PMKVY stands as a testament to the effectiveness of PPPs in skill development. Between FY17 and FY23, it achieved remarkable results:
  - **Around 1.1 crore individuals trained:** This translates to significant upskilling and reskilling of the workforce.
  - **Approximately 83% certified:** Certification validates acquired skills and enhances employability.
  - **Around 21.4 lakh placements:** Direct impact on livelihoods and economic growth.

Beyond PMKVY

- **Technical and Vocational Education and Training (TVET):** Focused on equipping individuals with job-ready skills, TVET programs are often driven by PPPs, leading to industry-relevant curriculum and practical training.
- **Corporate Social Responsibility (CSR):** Companies like TCS and Infosys leverage CSR initiatives to invest in education and skill development, directly contributing to a skilled workforce.
- Establishment of Adarsh Vidyalaya, or Model Schools, with a focus on teacher training, infrastructure, and learning outcomes.
- Atal Innovation Mission (AIM) is the government's flagship program designed to encourage innovation and entrepreneurship in institutions, universities, and schools.

PPP in Indian Healthcare: Bridging the Gap in Affordability and Accessibility

With a current healthcare budget share of only 2.1% of GDP, PPPs become crucial. They leverage the strengths of both the public and private sectors to build a more resilient and inclusive healthcare ecosystem. This is especially vital in a nation like India, with its vast population and diverse healthcare landscape.

The Urban-Rural Divide: A Stark Contrast

- **Urban Advantage:**
  - Around 66% of India's hospital beds are located in urban areas, serving just 28% of the population.
  - This translates to a significantly higher doctor-to-patient ratio and access to specialized care.
- **Rural Reality:**
  - The remaining 72% of the population residing in rural areas must contend with just one-third of the available hospital beds.
  - Access to specialists and advanced facilities is limited, and doctor availability is scarce, with almost 67% of doctors practicing in urban areas.

PPPs: A Pathway to Bridging the Gap

PPPs can play a transformative role in addressing these disparities and making healthcare more accessible and affordable for all Indians. **Here's how:**

- **Increased Investment:** Private sector participation can inject much-needed financial resources into the healthcare system, enabling the expansion and upgrading of infrastructure and services.
- **Improved Efficiency:** Private sector expertise can optimize resource allocation, streamline processes, and introduce innovative management practices, leading to better cost-effectiveness.
- **Enhanced Rural Reach:** PPPs can incentivize private providers to set up facilities and deliver services in underserved rural areas, bridging the geographical gap and improving accessibility.
- **Technological Adoption:** Private partners can bring in cutting-edge technology and digital solutions to improve healthcare delivery, such as telemedicine, remote diagnostics, and data-driven decision-making.

Building a Healthier Future for All

By harnessing the combined strengths of public commitment and private sector dynamism, PPPs hold immense potential to revolutionize India's healthcare landscape. Through strategic partnerships, the nation can work towards a future where quality healthcare is not a privilege, but a right, accessible and affordable, for every citizen, regardless of their location or socioeconomic status.

Apart from **Ayushman Bharat,** which provides secondary and tertiary care of up to 5 lakhs to the beneficiaries in both public and private hospitals, other notable Public-Private Partnership (PPP) healthcare projects in India include the **Andhra Pradesh-based Rajiv Aarogyasri Health Insurance Scheme, the Karnataka-based telemedicine services, the Tamil Nadu-based partnerships for medical education, and partnerships aimed at addressing non-communicable diseases, etc.**

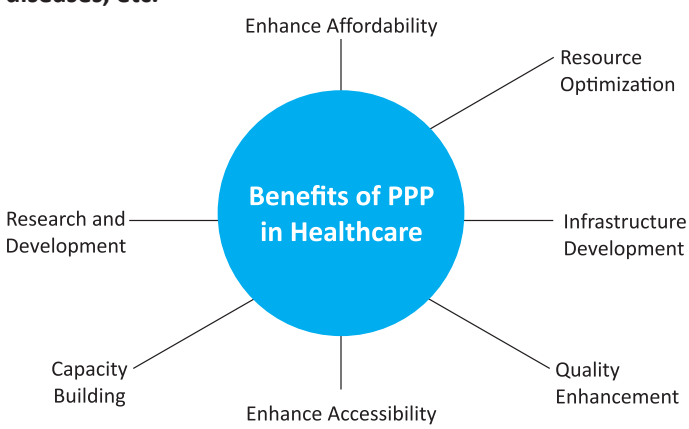


Fig. 18.7: PPP in Healthcare

PPP for Affordable housing

- India faces a serious and complex housing shortage as a result of the country's fast urbanization, population increase, and economic inequality. Millions of people are moving to cities in pursuit of work, which has increased demand for housing, especially for the low- and middle-class demographics. In order to guarantee shelter security, improve living conditions, and promote sustainable urban growth, there is an increasing need for strategic solutions to the urban housing crisis.

Principle Obstacles in the Way of Affordable Housing are

- Rapid Urbanization
- Land availability and cost
- Absence of clear title
- Construction cost
- Lack of clear policies and regulatory framework

Benefits of PPP in Affordable Housing

- **Mobilization of Funds and Resources:** In order to provide a rapidly expanding population with affordable housing, governments frequently encounter resource limits. PPPs can make it possible to mobilize resources and knowledge from the private sector to support government initiatives.
- **Accelerated Project Implementation:** PPPs can expedite the construction and development of affordable housing projects. Private sector efficiency and project management capabilities contribute to faster delivery of housing units.
- **Innovative Financing Models:** In order to make affordable housing developments financially viable and sustainable, private businesses might introduce new financing strategies, such as low-cost lending and alternative funding sources.
- **Risk Sharing:** Certain project risks can be assumed by the private sector, relieving pressure on public coffers and guaranteeing improved risk management.
- **Leveraging Private sector expertise:** Urban planning, project management, and building are areas where the private sector excels. Through partnerships with private organizations, the government can leverage this knowledge for effective and well-thought-out housing projects.

Addressing these challenges and achieving the goal of **Housing For All** requires a holistic approach that involves coordinated efforts from the government, private sector, and communities. **Bhubaneswar Affordable Housing and Rourkela Affordable Housing** are recent examples of this model.

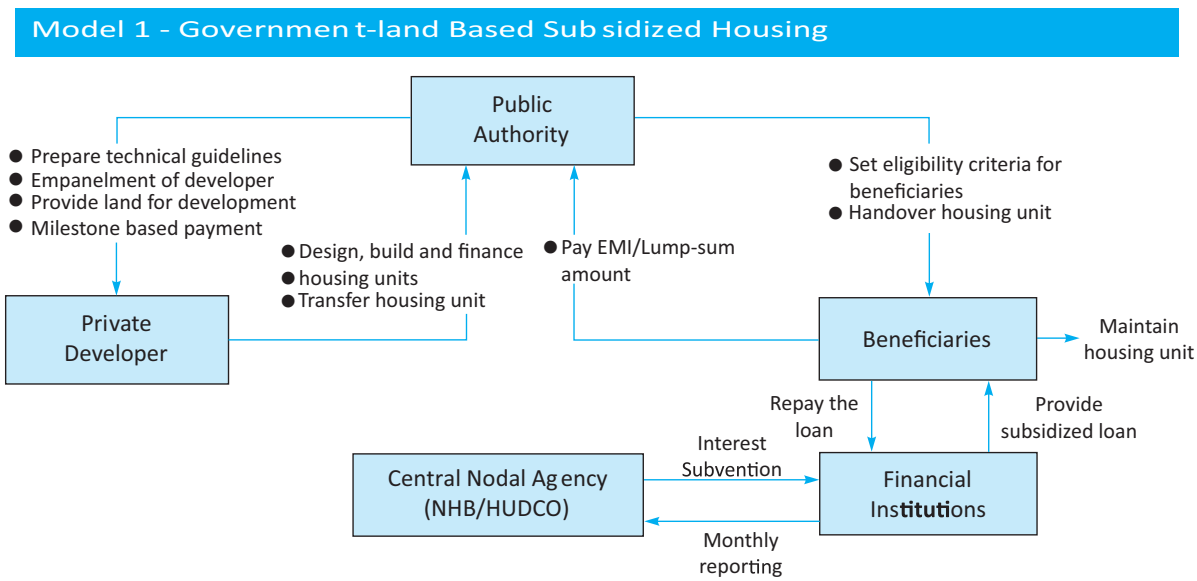


Fig. 18.8: Project Structure

Issues with The PPP Projects

1. **Purchasing land and getting clearances:** Prolonged land acquisition and difficulties acquiring required regulatory approvals can seriously affect the project schedules. Local communities may oppose land acquisition procedures, which could cause protracted delays.
2. **Regulatory Framework and Policies:** Investors may experience uncertainty as a result of shifting policies and inconsistent or ambiguous regulatory frameworks. Projects' ability to make money may be impacted by frequent changes to laws and policies.
3. **Financial Sustainability and Income Creation:** The financial feasibility of many infrastructure projects is a difficulty, especially in the transportation industry. The private sector partner's profitability may be impacted if revenue generation falls short of expectations, particularly in projects like toll highways.
4. **Delayed Payments:** Delayed payments by government agencies to private partners can strain the financial health of private sector entities.
5. **Risk Allocation and Management:** Inadequate risk assessment and allocation can lead to disputes between the public and private sectors.
6. **Capacity and Capability Constraints:** Limited capacity and capability within government agencies to prepare and manage PPP projects can contribute to delays and inefficiencies.
7. **Political and Social Factors:** Political changes and social resistance can affect the continuity of projects. Local opposition or changes in government priorities may result in project delays or cancellations.
8. **Lack of Standardization:** Lack of standardized procedures and documentation across projects can contribute to inefficiencies.

Government Initiatives

- **National Infrastructure Pipeline (NIP):** This ambitious program aims to invest ₹ 111 lakh crore in infrastructure projects over five years, with a significant focus on PPP models.
- **Viability Gap Funding (VGF):** The government provides financial support to bridge the viability gap in socially desirable but commercially unattractive infrastructure projects, making them more attractive to private investors.
- **Infrastructure Development Finance Scheme (IDFS):** This scheme provides long-term debt financing for PPP projects through dedicated institutions like India Infrastructure Finance Company Ltd. (IIFCL).
- **Special Purpose Vehicles (SPVs):** The government facilitates the creation of SPVs for PPP projects, providing land, regulatory clearances, and fiscal support in some cases.
- **Public-Private Partnership Appraisal Committee (PPPAC):** This committee evaluates and approves PPP proposals at the central level, ensuring quality and compliance with established norms.

Role of NITI Aayog

National Institution for Transforming India (NITI Aayog) has been actively involved in providing recommendations and policy guidance related to Public-Private Partnerships (PPPs) in India.

Several significant suggestions and actions concerning PPPs by NITI Aayog are as follows:

- **Model Concession Agreements:** Standardizing Model Concession Agreements (MCAs) for different sectors has been a focus of NITI Aayog's work. The purpose of these model agreements is to improve consistency and openness in contractual arrangements by offering a template for PPP project architecture.
- **Viability Gap Funding:** Viability Gap Funding (VGF) should be strategically used, according to NITI Aayog, to improve the financial sustainability of PPP projects—particularly in industries where income collection can be difficult.
- **Developing Capabilities and Training:** Building capability among government entities participating in PPP project development and delivery is important, as stressed by NITI Aayog. This comprises workshops and training courses to improve the qualifications of authorities working on PPP projects. NITI Aayog, in its document **'Strategy for New India @75',** targeted investment rates to **36 percent by 2022-23 from 28 percent in 2017-2018**.
- **PPP Evaluation and Monitoring:** The organization has pushed for strong evaluation and oversight procedures for PPP initiatives in order to guarantee efficient execution and handle obstacles throughout the project's lifespan.
- **Industry-Specific Suggestions:** To increase private sector involvement in vital fields, NITI Aayog offers sector-specific proposals like for infrastructure development, healthcare, education, and renewable energy.
- **Framework for PPP Policy:** To create a policy framework that is favorable to PPPs, NITI Aayog works with the central and state governments to remove obstacles related to regulations and procedures. This helps draw in private investment.

Way Forward

- **Standardized Contracts and Streamlined Approvals:** Develop standardized PPP contracts and expedite project approvals through single-window clearance systems to reduce delays and complexities.
- **Focus on Risk Allocation and Viability:** Ensure fair and transparent risk allocation mechanisms and prioritize commercially viable projects with strong revenue streams to attract private sector participation.
- **Capacity Building and Knowledge Sharing:** Build government and private sector expertise in PPP project management, financial modeling, and contract structuring through training programs and knowledge-sharing initiatives.
- **Promoting Innovation and Green Infrastructure:** Encourage and incentivize the use of innovative technologies and environmentally sustainable practices in PPP projects for long-term economic and environmental benefits.
- **Enhancing Transparency and Accountability:** Implement robust monitoring and evaluation mechanisms, promote public disclosure of project details, and establish grievance redressal channels to foster trust and accountability.

CONCLUSION

The current PPP model in India requires improvements in emphasizing service delivery over financial gains, mitigating risks, and enhancing financial management. Implementing the Vijay Kelkar Committee's recommendations, discouraging unsolicited proposals, and fostering good governance can revitalize the model and attract private investment for India's infrastructure development.

International Financial Institutions

19

INTRODUCTION

International Financial Institutions, which are also commonly referred as IFIs, are financial establishments formed by the collaboration of multiple nations. These entities operate under the jurisdiction of international law and are owned and overseen by respective national governments. While national governments primarily serve as owners and managers, there are instances where other international institutions and organizations may also participate as stakeholders.

The IFIs are created by multiple nations, although some bilateral (established by two or more countries) financial institutions still exist and are also considered in the same category.

BRETTON WOODS CONFERENCE

The United Nations Monetary and Financial Conference, commonly referred to as the Bretton Woods Conference, marked a significant event in history, bringing together **44 Allied nations** in **Bretton Woods, New Hampshire, United States**, during the period of **July 1 to 22, 1944**. The key goals of the conference were to institute a fresh international monetary system and support the economic rebuilding and development efforts following World War II.

01
Collaborative Economic Commitment: Nations at the conference pledged to work collectively to ensure global economic stability and promote growth.
Advancement of Open Trade: The primary goal was to diminish trade barriers and foster multilateral trade.
02
03
Establishing Exchange Rate Stability: The conference sought to implement a secure exchange rate system, designating the US dollar as the primary reserve currency.
Financial Aid for Post-War Recovery and Development: The conference aimed to create institutions providing financial assistance for the reconstruction of war-torn economies and stimulating economic growth in developing nations.
04

Fig. 19.1: Political Principles

Bretton Woods Conference Agreements

- **International Monetary Fund (IMF):** It was formed to supervise the new exchange rate system and provide short-term financial aid.
- **International Bank for Reconstruction and Development (IBRD):** It was established for long-term financial assistance in post-war reconstruction and development.
- **Fixed Exchange Rate System:** Various nations agreed to peg currencies to the US dollar, ensuring stability and promoting international trade.
- **Abolition of Exchange Controls:** It was aimed at removing restrictions on currency convertibility, fostering free capital flow.

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

The General Agreement on Tariffs and Trade (GATT) was a legal accord to diminish trade barriers, and involve the elimination or reduction of quotas, tariffs, and subsidies, albeit with some notable restrictions retained. **Signed on October 30, 1947, by 23 countries**, GATT was established to aid the global economy's post-World War II recovery by promoting the reconstruction and liberalization of international trade.

Purpose

- The establishment of the GATT aimed to institute regulations that would eliminate or restrict the most costly and inefficient aspects of the prewar protectionist era. Notably, it targeted quantitative trade barriers such as trade controls and quotas. The agreement also set up a mechanism for resolving international commercial disputes and a framework for engaging in multilateral negotiations to reduce tariffs.
- In the post-war era, the GATT was regarded as a notable success.

Benefits

The GATT regulates the contracting parties to fulfill the agreement's objectives of reducing tariffs and other trade impediments, fostering international trade liberalisation. It creates opportunities for expanding exports and earnings. Implementing robust and transparent trading standards also contributes to improved planning and execution of investment and trade activities.

Uruguay/Eighth Round (Sept 1986 – April 1994)

The Uruguay Round was the eighth round of multilateral trade negotiations conducted within the framework of the General

Agreement on Tariffs and Trade (GATT). It was held from 1986 to 1994 and led to the creation of the World Trade Organization (WTO). The round covered a wide range of issues, including agriculture, intellectual property, and services.

In addition to traditional discussions on goods trade, the Eighth Round broadened the trading system, including services and intellectual property. It aimed to revamp sensitive agricultural sectors and review all original GATT articles. The agenda also introduced a new institution to refine the Dispute Settlement System and Trade Policy Review Mechanism, facilitating systematic evaluations of national trade policies.

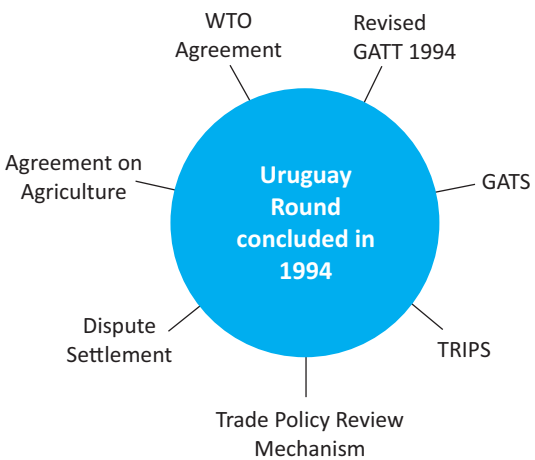


Fig. 19.2: Uruguay Round 1994

The Uruguay Round concluded in 1994 with ministers from 123 countries signing key agreements on April 15 in Marrakesh, Morocco

WORLD TRADE ORGANISATION

The World Trade Organization (WTO) stands as the sole global international organization tasked with regulating trade rules among nations. At its core are the WTO agreements, crafted through negotiations and signed by a majority of the world's trading nations, subsequently ratified in their respective parliaments. Currently, the WTO boasts 164 members, including the European Union and 23 observer governments, such as Iran, Iraq, Bhutan, and Libya, among others.

Origin of WTO

The World Trade Organization (WTO) traces its roots back to the General Agreement on Tariffs and Trade (GATT), established in 1947. The transition from GATT to the WTO occurred during the Uruguay Round (1986-1994), leading to the formal creation of the WTO. The organisation commenced its operations on January 1, 1995. The pivotal agreement establishing the WTO, commonly referred to as the **"Marrakesh Agreement,"** was signed in Marrakesh, Morocco, in 1994.

Why WTO Superseded GATT

After the Uruguay Round, the World Trade Organization (WTO) was created to replace GATT as an international organisation.

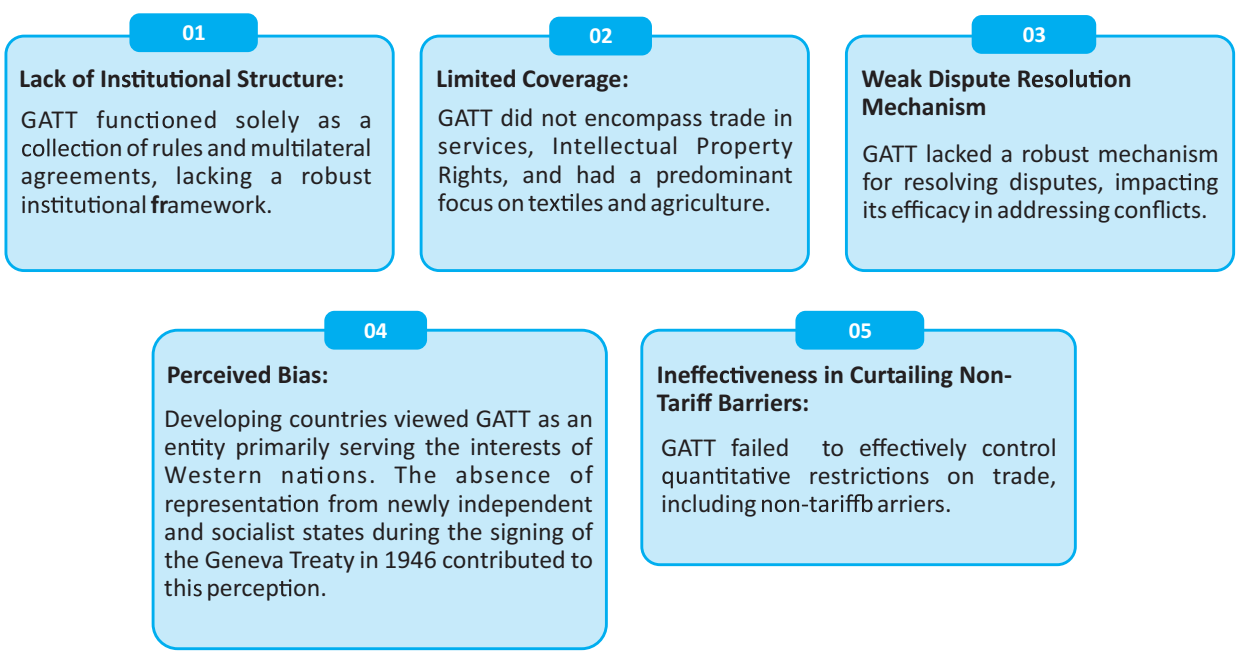

01
Lack of Institutional Structure:
GATT functioned solely as a collection of rules and multilateral agreements, lacking a robust institutional framework.
02
Limited Coverage:
GATT did not encompass trade in services, Intellectual Property Rights, and had a predominant focus on textiles and agriculture.
03
Weak Dispute Resolution Mechanism
GATT lacked a robust mechanism for resolving disputes, impacting its efficacy in addressing conflicts.
04
Perceived Bias:
Developing countries viewed GATT as an entity primarily serving the interests of Western nations. The absence of representation from newly independent and socialist states during the signing of the Geneva Treaty in 1946 contributed to this perception.
05
Ineffectiveness in Curtailing Non-Tariff Barriers:
GATT failed to effectively control quantitative restrictions on trade, including non-tariffb arriers.

Fig. 19.3: Why WTO Superseded GATT

WTO Key Principles

- **Principle of Equal Treatment:**
  - **Most Favored Nation (MFN) Rule:** It mandates equal treatment of all WTO members in trade conditions for a specific product type.

- **National Treatment Policy:** It ensures imported goods receive no less favorable treatment than domestically produced goods, addressing non-tariff trade barriers.

❑ **Reciprocity Principle:**
- It aims to curtail free-riding potential arising from the MFN rule and seeks enhanced access to foreign markets through negotiation.

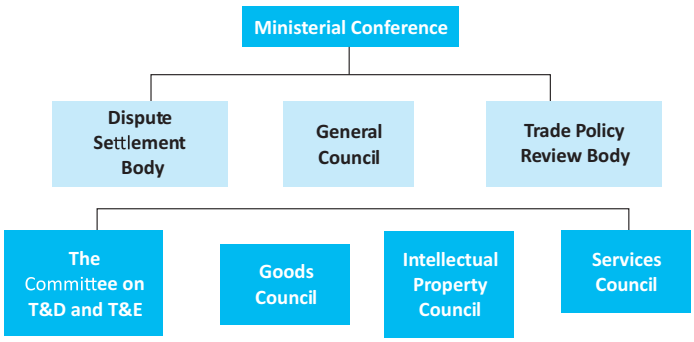


Fig. 19.4: Structure of WTO

❑ **Binding and Enforceable Commitments:**
- Tariff commitments are documented in a legal instrument known as a schedule of concession resulting from multilateral trade negotiations and accession.

❑ **Principle of Transparency:**
- WTO members must publish trade regulations, maintain institutions for reviewing administrative decisions affecting trade, respond to information requests from other members, and notify changes in trade policies to the WTO.
- Periodic country-specific reports, facilitated by the Trade Policy Review Mechanism (TPRM), enhance transparency.

❑ **Safety Valve Principles:**
- Governments can, under specific circumstances, restrict trade to protect the environment, public health, animal health, and plant health, as permitted by WTO agreements.
- **Dumping** is the practice of exporting goods to another country at a price lower than in the home market, aiming to gain a competitive advantage over local producers in the importing country. This is considered an unfair trade practice and is prohibited by the WTO.
  - ❒ **Examples of dumping cases:**
    - ◊ In 2018, the U.S. imposed anti-dumping duties on Chinese aluminium foil imports due to Chinese companies selling the product at unfairly low prices.
    - ◊ In 2021, India imposed anti-dumping duties on five Chinese products, including certain aluminium goods and some chemicals.

GOVERNANCE OF THE WTO

Ministerial Conference

The paramount decision-making entity within the WTO is the Ministerial Conference, usually convening every two years. This assembly includes all WTO members, encompassing countries and customs unions. The Ministerial Conference holds the authority to make decisions across the spectrum of multilateral trade agreements.

❑ The last Ministerial Conference, the **12th** one, was held in **Geneva, Switzerland, from 12 to 17 June 2022.** It was co-hosted by Kazakhstan and chaired by **Mr Timur Suleimenov**, Deputy Chief of Staff of Kazakhstan's President.

❑ The next Ministerial Conference, the **13th** one, will be held in **Abu Dhabi, United Arab Emirates, from 26 to 29 February 2024**. It will be chaired by **H.E. Dr Thani bin Ahmed Al Zeyoudi**, UAE's Minister of State for Foreign Trade.

General Council

❑ Situated in Geneva, the General Council serves as the highest-level decision-making body of the WTO, convening regularly to execute the organization's functions.

❑ Comprising representatives, usually ambassadors or their equivalents, from all member governments, the General Council is empowered to act on behalf of the Ministerial Conference only when specifically authorized to do so, which convenes approximately every two years.

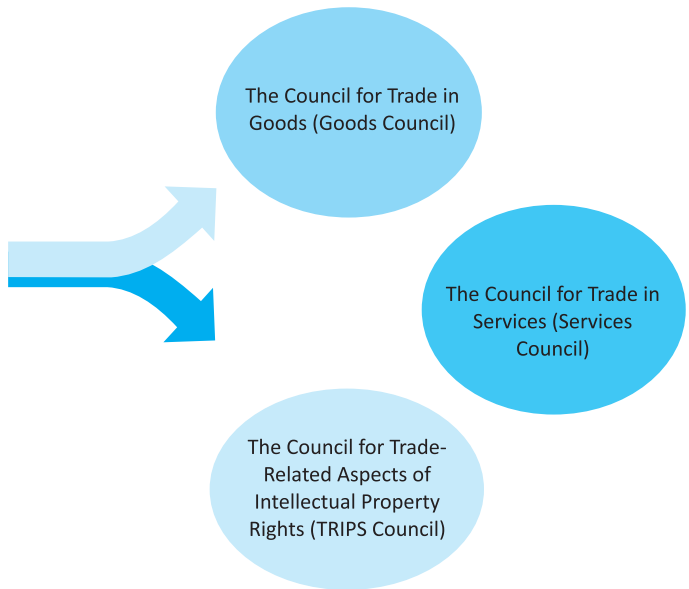

The Council for Trade in Goods (Goods Council)
The Council for Trade in Services (Services Council)
The Council for Trade-Related Aspects of Intellectual Property Rights (TRIPS Council)

Fig. 19.5: Three Councils, Each Overseeing Distinct Areas of Trade, Report to the General Council

❑ Additionally, the General Council convenes separately as the General Council, the Trade Policy Review Body, and the Dispute Settlement Body (DSU).

Three councils, each overseeing distinct areas of trade, report to the General Council:

These councils, represent all WTO members, and are responsible for overseeing the implementation of WTO agreements within their respective trade domains.

SPECIAL AND DIFFERENTIAL TREATMENT (S &D)

S&D provisions are special and differential treatment provisions that give developing countries special rights and allow other members to treat them more favourably in the WTO. These provisions include longer time periods for implementing agreements and commitments, measures to increase trading opportunities for developing countries, provisions requiring all WTO members to safeguard the trade interests of developing countries, support to help developing countries build the capacity to carry out WTO work, handle disputes, and implement technical standards, and provisions related to least-developed country (LDC) members.

Some of the benefits of S&D provisions for developing countries are:

- They can protect their domestic industries from foreign competition by imposing tariffs or quotas.
- They can benefit from preferential market access schemes offered by developed countries, such as the Generalized System of Preferences (GSP).
- They can receive technical assistance and training from developed countries or international organizations to improve their trade capacity and infrastructure.
- They can have more flexibility and discretion in implementing their obligations and commitments under the WTO agreements.
- They can have more voice and influence in the WTO decision-making process.

However, some of the challenges and criticisms of S&D provisions are:

- They are not well-defined or operationalized, and there is no clear criteria or mechanism to determine who qualifies as a developing country or an LDC.
- They are often non-binding or conditional, and depend on the goodwill and cooperation of developed countries.
- They may create a dependency culture and discourage developing countries from undertaking necessary reforms and adjustments to integrate into the global trading system.
- They may create trade distortions and inefficiencies, and undermine the principle of non-discrimination and reciprocity in the WTO.
- They may not address the root causes of the development gap and the structural problems faced by developing countries.

APPLICATION OF SANITARY AND PHYTOSANITARY MEASURES AGREEMENT (SPS AGREEMENT)

- **Origin and Negotiation:**
  - Developed during the Uruguay Round of negotiations.
- **Scope and Restrictions:**
  - Governs WTO member-state policies on food security, bacterial contaminants, pesticides, scrutiny, labelling, and animal and plant health (phytosanitation) concerning imported pests and diseases.
  - Recognizes the importance of adhering to scientific standards in determining the risk associated with specific sanitary and phytosanitary measures.
- **Trade Impact:**
  - Acknowledges that sanitary and phytosanitary measures, along with technical regulations, can lead to trade restrictions.
  - Encourages international cooperation among member states to establish harmonised standards and guidelines for sanitary and phytosanitary measures.
- **Legitimate Objectives:**
  - Recognizes the necessity of such measures for legitimate objectives like ensuring food safety and protecting human, animal, or plant life.
  - Provides for periodic reviews and updates to ensure the relevance and effectiveness of sanitary and phytosanitary measures in light of evolving scientific knowledge and technological advancements.
- **Potential for Misuse:**
  - Acknowledges the risk of these measures being used for protectionist purposes, especially as import tariffs decrease.
  - Emphasizes the need for transparency and communication among member states to prevent the misuse of sanitary and phytosanitary measures for protectionist ends.
- **Forms of Measures:**
  - It can take various forms, including specifying disease-free areas of origin, safety checks, and setting permissible levels of pesticide residues.
- **Applicability:**
  - Applies not only to domestically produced food local animal and plant diseases, but also to goods from other countries.
  - Highlights the importance of considering the socio-economic impacts of sanitary and phytosanitary measures on developing countries and providing technical assistance where necessary.

- **Burden of Proof:**
  - Under the SPS Agreement, members must scientifically prove the riskiness of something before imposing regulations.
  - It stresses the significance of capacity-building and technical assistance to help developing countries meet the stringent requirements of sanitary and phytosanitary measures.
- **WTO Intervention:**
  - If there is no scientific evidence, the WTO has the authority to nullify a country's right to enforce such restrictions.
  - It reinforces the need for a fair and transparent dispute resolution mechanism, ensuring that disputes related to sanitary and phytosanitary measures are resolved impartially and effectively.

THE WTO AGREEMENT ON AGRICULTURE (AOA)

The World Trade Organization's Agreement on Agriculture (AoA) pertains to fundamental agricultural products and the products originating and processed from them. The broader agreements of the WTO encompass beverages such as wines, spirits, tobacco products, and fibres like cotton. It is worth noting that fish and its products, as well as forestry products, fall under the purview of the WTO's **Non-Agricultural Market Access (NAMA)** negotiations, as outlined in the **2001 Doha Declaration**. The Agreement on Agriculture is structured around three significant Pillars. These are: market access, domestic support and export competition.

Market Access

- The regulation governing market access for agricultural products follows the "tariffs only" principle. This means that all non-tariff measures were either to be removed or substituted with tariffs, ensuring a relatively uniform level of protection. This transformation process is commonly referred to as "tariffication."
- Under the Agreement on Agriculture (AoA), WTO members are obligated to establish tariff bindings for agricultural products and undertake commitments to reduce tariffs, as outlined in each member's WTO Schedule of concessions on goods.
- Distinct reduction commitments are applicable to both developing and developed members. Least Developed Countries (LCDs) were exempted from the requirement to reduce their terrifs.

Fig. 19.6: Market Access – Tariffs Only

Domestic Support (Subsidies)

This is premised on the assumption that not all subsidies distort trade to the same scale. The agreement differentiates two classes of domestic support:

- Domestic support with no, or least, distorting effects on trade – not subject to reduction commitments. These were put in the green box and blue box measures.
- Domestic support distorts trade effects – subject to restrictions and reduction commitments. These were put under amber box measures.

Subsidies	Description
Green Box	All those subsidies that do not distort trade or lead to minimal distortion, come below the green box. For example, All government services like research and development, disease control, and all other subsidies offered to the farmers, that do not impact global trade directly.
Amber Box	All types of domestic subsidies or backing that can distort production and trade (with certain exceptions) come under the amber box category. The measures to support prices fall under this category. Examples include input subsidies such as subsidy for fertilisers, seeds, electricity, irrigation etc. The exception is the provision that welcomes subsidies up to 5% of agricultural production for developed nations and up to 10% for developing nations.
Blue Box	All the amber box subsidies that tend to restrict production comes under the blue box. This can be increased with no restriction, as long as subsidies are linked to production-limiting programs. **Examples:** Subsidies linked with the capping of acreage or number of animals.

Export Competition

It focus on Eliminating export subsidies and other measures that artificially boost exports and harm competitors. The aims to ensure fair competition in the global marketplace and prevent countries from dumping their products on the international market.

WTO Agricultural Challenges: India's Programmes and Waiver Issues

Public Stockholding Program and Waiver

- **Issue:** India, like some other developing countries, operates a Public Stockholding Program to support its farmers and ensure food security. The program involves the government purchasing agricultural products at minimum support prices to build food stocks for distribution to vulnerable populations.
- **Waiver:** The existing WTO rules, particularly the AoA, impose limits on the level of domestic support that a member country can provide to its farmers. To address this, a "peace clause" was agreed upon during the **2013 Bali Ministerial Conference**. The peace clause provides a temporary reprieve, or waiver, to developing countries like India, allowing them to exceed the prescribed limits on domestic support without facing legal challenges until a permanent solution is found.
- **Peace Clause:**
  - **Issue:** The peace clause was intended to provide a temporary solution to the issue of breaching domestic support limits under the AoA. The peace clause provided temporary relief from legal challenges regarding exceeding support limits, not from the obligation to comply with the AoA rules. However, negotiations for a permanent solution have been ongoing.
  - **Challenges:** The peace clause has limitations, and there have been discussions within the WTO to find a long-term solution to the issue of public stockholding programs in developing countries. Developing countries, including India, have sought a permanent solution that ensures food security without the threat of legal action under the AoA.
- **Special Safeguard Mechanism (SSM):**
  - **Issue:** The Special Safeguard Mechanism is another provision within the AoA that allows developing countries to impose additional tariffs on agricultural products in the event of import surges or price declines. This is intended to protect domestic farmers from sudden and unforeseen import surges that could harm their livelihoods.
  - **Challenges:** There have been debates and negotiations within the WTO regarding the operationalization and effectiveness of the SSM. Developing countries, including India, have argued for a robust SSM to safeguard their agricultural sectors, while some developed countries have expressed concerns about potential misuse or abuse of such measures. The SSM is rarely used by developing countries due to complexities in operationalization and concerns about potential retaliation.

SAFEGUARD DUTY IN INDIA

Safeguard duty is a type of trade remedy measure which a WTO member can apply to protect its domestic industry from a surge of imports that causes or threatens to cause serious injury. The Agreement on Safeguards sets out the rules and procedures for applying such measures, which must be temporary, non-discriminatory, and subject to compensation or retaliation.

- India has enacted the Customs Tariff Act of 1975 and the Customs Tariff (Identification and Assessment of Safeguard Duty) Rules of 1997 to implement the provisions of the Agreement on Safeguards.
- India has imposed safeguarding duty on various products, such as steel, solar cells, and hot-rolled flat products, to protect its domestic producers from increased imports.
- India's role in safeguarding duty is to balance its interests as both an importer and an exporter of various products. India has used safeguarding duty as a tool to protect its domestic industries from unfair competition and injury caused by increased imports, especially from China.
- However, India has also faced safeguarding duty imposed by other countries on its exports, such as steel, textiles, and chemicals.
- India has also been active in the WTO negotiations and disputes related to safeguarding duty. India has advocated for the special and differential treatment of developing countries in the application of safeguarding duty, and has challenged the safeguarding duty imposed by the US and the EU on various occasions.
- India has also supported the multilateral rules and disciplines on safeguarding duty, and has complied with the WTO procedures and obligations in its own safeguarding duty investigations and measures

INFORMATION TECHNOLOGY AGREEMENT (ITA)

- **India is a participant** in the Information Technology Agreement (ITA), also known as ITA-1, within the WTO.
- The ITA has a total of 75 member signatories, including 27 EU member countries, representing about 97 percent of global trade in Information Technology (IT) products.
- India joined the ITA on March 25, 1997.
- Developed country members, including the USA, European Union, and Japan, have proposed expanding the ITA's scope, referred to as ITA-2, in recent ITA Committee meetings.
- Proposals for ITA-2 include increasing the coverage of IT products with zero-bound customs duty, addressing

non-tariff measures, and including new signatories like Argentina, Brazil, and South Africa.

- Advocates of ITA expansion have compiled a consolidated list of IT products for tariff reductions, currently under active discussion within the WTO.
- India's past experience with the ITA has been discouraging, impacting its IT industry significantly, while China has been a major beneficiary, increasing its global market share from 2% to 14% between 2000-2011.
- Considering recent government initiatives to foster a robust manufacturing environment in Electronics and Information Technology, India has decided not to participate in ITA expansion negotiations at this time, aligning with the domestic IT industry's viewpoint.

TRADE-RELATED INVESTMENT MEASURES (TRIMS) AGREEMENT

- The TRIMS Agreement, established during the Uruguay Round, recognizes that certain investment measures can have limiting effects on global trade in goods. It particularly focuses on policies such as local content requirements and trade balancing rules, which have traditionally aimed at advancing domestic industries' interests and countering restrictive business practices.
- The primary obligation outlined in this agreement stipulates that members must refrain from implementing any trade-related investment measure that contradicts either Article III (national treatment) or Article XI (elimination of quantitative constraints) of the GATT.

The Trims Agreement Explicitly Prohibits The Following Practices

Local content requirements: Measures compelling enterprises to purchase or use domestic products.
Trade balancing requirements: Measures restricting an entity's purchases or use of imported goods based on the quantity or value of local goods it exports.
Restrictions on foreign exchange: Measures limiting imports by restricting access to foreign exchange.
Domestic sales requirements: Measures limiting exports proportionally to the quantity or value of local production.
Developing countries are granted the flexibility to retain TRIMs in alignment with their economic development needs.

Fig. 19.7: Prohibited Practices under TRIMS

GENERAL AGREEMENT ON TRADE IN SERVICES (GATS)

The basic obligations under the General Agreement on Trade in Services (GATS) are:

- **Most-favored-nation (MFN) treatment:** This means that each WTO member must treat services and service suppliers from all other WTO members equally, without discrimination based on nationality.
- **Transparency:** This means that each WTO member must publish and notify all relevant measures affecting trade in services, and establish enquiry points to provide information to other WTO members and service suppliers.
- **Economic integration:** This means that each WTO member must notify and seek approval from the WTO for any regional trade agreements or preferential arrangements that cover trade in services.

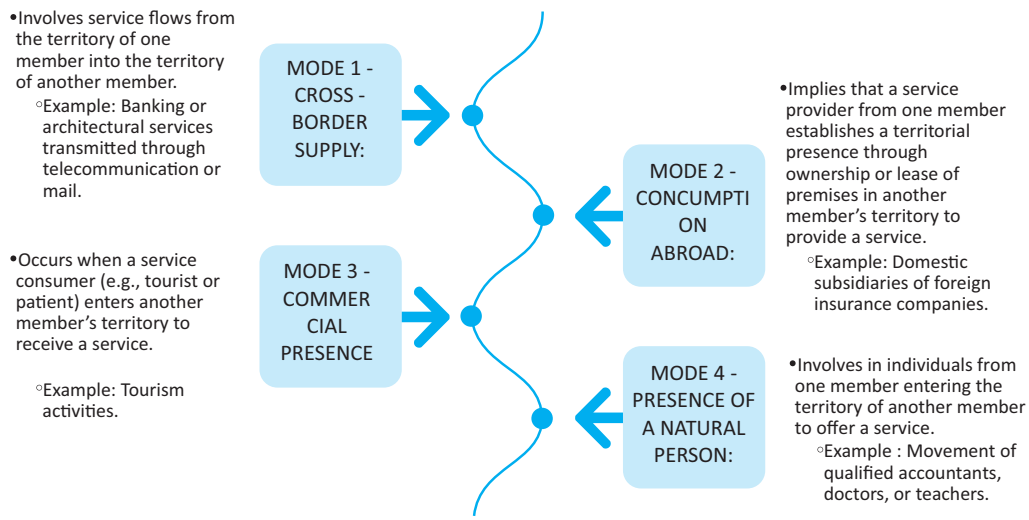

MODE 1 - CROSS - BORDER SUPPLY:
•Involves service flows from the territory of one member into the territory of another member.
◦Example: Banking or architectural services transmitted through telecommunication or mail.
MODE 2 - CONCUMPTION ABROAD:
•Implies that a service provider from one member establishes a territorial presence through ownership or lease of premises in another member's territory to provide a service.
◦Example: Domestic subsidiaries of foreign insurance companies.
MODE 3 - COMMERCIAL PRESENCE
•Occurs when a service consumer (e.g., tourist or patient) enters another member's territory to receive a service.
◦Example: Tourism activities.
MODE 4 - PRESENCE OF A NATURAL PERSON:
•Involves in individuals from one member entering the territory of another member to offer a service.
◦Example : Movement of qualified accountants, doctors, or teachers.

Fig. 19.8

- **Domestic regulation:** This means that each WTO member must ensure that its domestic regulations affecting trade in services are administered in a reasonable, objective, and impartial manner, and are not more burdensome than necessary to ensure the quality of the service.
- **Recognition:** This means that each WTO member must give adequate opportunity to other WTO members to negotiate the recognition of qualifications, standards, or licenses of service suppliers, and not discriminate between WTO members in this regard.

- **Payments and transfers:** This means that each WTO member must allow all payments and transfers related to trade in services to be made freely and without delay, subject to certain exceptions for balance-of-payments difficulties or prudential reasons.
- **Restrictions to safeguard the balance of payments:** This means that each WTO member may impose temporary restrictions on trade in services to safeguard its balance of payments under certain conditions and procedures.
- **General exceptions:** This means that each WTO member may adopt or maintain measures that are inconsistent with the GATS obligations for the purpose of protecting public morals, human, animal or plant life or health, national security, or other public policy objectives, subject to certain conditions and limitations.
- These obligations apply to all WTO members and all service sectors, unless otherwise specified in the GATS or in a member's schedule of specific commitments.

INTELLECTUAL PROPERTY RIGHTS

- Intellectual Property Rights (IPR) refer to the rights granted to individuals over the products of their intellectual endeavors, encompassing inventions, literary and artistic works, as well as symbols, names, and images utilized in commerce. Typically, these rights grant the creator exclusive control over the utilization of their creation for a specific duration.
- **Article 27 of the Universal Declaration of Human Rights** delineates these rights, acknowledging the entitlement to benefit from the protection of moral and material interests arising from the authorship of scientific, literary, or artistic productions.
- The recognition of the significance of intellectual property dates back to the **Paris Convention for the Protection of Industrial Property (1883)** and the **Berne Convention for the Protection of Literary and Artistic Works (1886)**. Both conventions are under the administration of the **World Intellectual Property Organization (WIPO)**.

Intellectual Property Rights are Conventionally Categorized into Two Primary Areas

(i) **Copyright and Rights Related to Copyright:** These pertain to the rights of authors of literary and artistic works (such as books, musical compositions, paintings, sculptures, computer programs, and films). Copyright protection extends for a minimum of 50 years after the author's death.

(ii) **Industrial Property:** This category includes protection for distinctive signs, specifically trademarks and geographical indications. Trademarks distinguish the goods or services of one entity from others, while Geographical Indications (GIs) identify goods as originating from a place where a specific characteristic is essentially tied to its geographical origin. The protection of these signs encourages fair competition and consumer protection.

Industrial designs and trade secrets fall under another segment of industrial property, primarily safeguarding innovation, design, and technological creations. This comprises inventions (protected by patents), industrial designs, and trade secrets. Protection for these forms of intellectual property aims to stimulate creativity and technological advancement.

India and Intellectual Property Rights (IPR)

- India, as a member of the World Trade Organization (WTO), is steadfast in its commitment to the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement).
- Additionally, India holds membership in the World Intellectual Property Organization (WIPO), an entity dedicated to advancing the safeguarding of intellectual property rights globally.
- India's participation extends to several vital WIPO-administered International Treaties and **Conventions related to IPRs.**

IPR Policy and Indian Patents Act

- The Indian Patents Act 1970 is the primary legislation governing patents in India. The act provides for the grant of patents for inventions that are new, non-obvious, and useful. The act also provides for compulsory licensing of patents under certain circumstances.
- One of the main provisions of the Indian Patents Act is Section 3(d), which sets out the criteria for patentability of new forms of known substances. This provision requires that new forms of known substances must demonstrate enhanced efficacy over the existing substance to be eligible for patent protection. This provision has been helpful in preventing the grant of frivolous patents and promoting access to affordable medicines.
- Compulsory licensing is a provision under the Indian Patents Act that allows the government to grant licenses to third parties to manufacture, use, or sell a patented invention without the consent of the patent holder. Compulsory licensing is granted in certain circumstances, such as national emergencies, public health crises, or when the patent holder has failed to make the invention available to the public at a reasonable price.
- The Controller General of Patents, Designs, and Trademarks is the authority responsible for the administration of the Indian Patents Act. The controller is responsible for granting patents, registering designs and trademarks, and maintaining a register of patents, designs, and trademarks

National IPR Policy, 2016

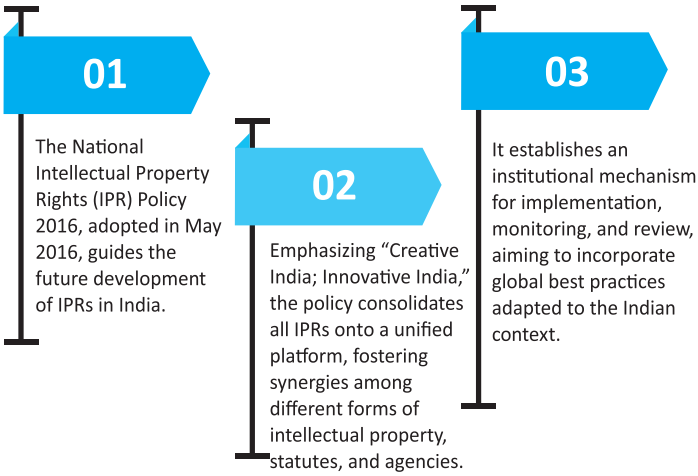

01
The National Intellectual Property Rights (IPR) Policy 2016, adopted in May 2016, guides the future development of IPRs in India.
02
Emphasizing "Creative India; Innovative India," the policy consolidates all IPRs onto a unified platform, fostering synergies among different forms of intellectual property, statutes, and agencies.
03
It establishes an institutional mechanism for implementation, monitoring, and review, aiming to incorporate global best practices adapted to the Indian context.

Fig. 19.9: National IPR Policy

Achievements Under Revised IPR Framework

- **Enhanced Global Innovation Index Ranking**
- **Fortified Institutional Mechanism for IP**
- **Reduced Pendency in IP Applications**
- **Automated Certificate Issuance**
- **Surge in Patent and Trademark Filings:**
  - According to the Global Innovation Index 2023, India has climbed to the 40th rank in the world in terms of innovation. India has also been ranked 10th globally in the number of patents filed and 8th in terms of trademarks.
  - Remarkable growth of nearly 28% in trademark filings during this duration.
- **Streamlined IP Processes**
- **IPR Awareness Initiatives**
- **Establishment of Technology and Innovation Support Centres (TISCs)**

Challenges in India's IPR Landscape

- **Section 3(d) Restrictions:**
  - Section 3(d) of the Indian Patent Act 1970, amended in 2005, prohibits patents for new forms of known substances unless they significantly differ in properties, preventing evergreening. This has raised concerns for pharmaceutical companies.
- **Compulsory Licensing (CL) Concerns:**
  - The issue of Compulsory Licensing (CL) poses challenges for foreign investors, especially in technology transfer, fearing potential misuse. It has impacted India-EU Free Trade Agreement (FTA) negotiations.
- **Impact on India's International Standing:**
  - India is on the United States Trade Representative's (USTR's) 'Priority Watch List,' facing allegations of intellectual property rights (IPR) violations. The USTR labels India as one of the world's most challenging major economies regarding IP protection.
- **Data Exclusivity Demands:**
  - Foreign investors and multinational corporations argue that Indian law lacks protection against unfair commercial use of test data submitted for market approval. They advocate for a Data Exclusivity law.
- **Weak Copyright Act Enforcement:**
  - Enforcement of the Copyright Act is perceived as weak, contributing to widespread piracy of copyrighted materials, further posing challenges in intellectual property protection.

TRADE-RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS (TRIPS)

- The Trade-Related Aspects of Intellectual Property Rights Agreement (WTO TRIPS Agreement) pertains to intangible assets stemming from human intellectual and creative endeavours, encompassing inventions, designs, artistic creations, and more, collectively referred to as "intellectual property."
- Legal protection is granted to various forms of intellectual property, such as inventions, trademarks, designs, literary works, layout designs of integrated circuits, and trade secrets. The escalating volume of trade in goods and services related to intellectual property underscores its increasing significance for the global economy. Inadequate protection of intellectual property has the potential to distort free trade.
- Recognizing this challenge, the World Trade Organization (WTO) endeavoured to establish an effective framework for safeguarding intellectual property, contributing to a more orderly global trade system. Existing global treaties, including the Paris Convention (1883) and the Berne Convention (1886), already provide a common legal foundation for intellectual property protection.
- Governments worldwide acknowledged the need for a comprehensive global agreement to establish standards for the trade aspects of intellectual property protection. Consequently, within the Uruguay round negotiations, negotiators from the General Agreement on Tariffs and Trade (GATT) initiated discussions leading to the creation of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement.
- After extensive negotiations, a consensus on the WTO TRIPS Agreement was reached in Marrakesh in April 1994, and it officially came into effect on January 1, 1995. This agreement represents one of the most significant developments arising from the Uruguay round negotiations.

GI Act 1999

- The Geographical Indications of Goods (Registration and Protection) Act, 1999 is an Indian law that provides for the registration and protection of geographical indications (GIs) in India. GIs are indications that identify a good as originating in a particular territory, where a given quality, reputation, or other characteristic of the good is essentially attributable to its geographical origin. Some examples of Indian GIs include Darjeeling tea, Kanchipuram silk saree, Alphonso mango, Nagpur orange, and Kolhapuri chappal.
- The GI Act 1999 is compliant with TRIPS, which requires WTO members to provide legal protection to GIs, including those of foreign countries, and to prevent the use of misleading indications of source on goods.

The Traditional Knowledge Digital Library (TKDL)

- The Traditional Knowledge Digital Library (TKDL) is a collaborative project between the Council of Scientific and Industrial Research (CSIR) and the Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) of the Government of India.
- The purpose of the TKDL is to protect traditional knowledge from misappropriation by creating a digital library of traditional knowledge in a patent-friendly format. The TKDL contains information on traditional knowledge related to Ayurveda, Unani, Siddha, and Yoga.
- The TKDL has made significant progress since its inception in 2001. As of 2021, the TKDL has documented over 2.9 Lakh medicinal formulations from Ayurveda, Unani, and Siddha. The TKDL has also been successful in preventing the grant of patents on traditional knowledge by patent offices in other countries.

Key Elements of the TRIPS Agreement

- TRIPS encompasses all officially recognized intellectual property rights, covering copyright and related rights, patents, industrial designs, trademarks, geographical indications, layout designs of integrated circuits, and undisclosed information.
- It builds upon and enhances the protection levels established by the Paris Convention for industrial property rights and the Berne Convention for copyright.
- In the realm of copyrights and related rights, TRIPS specifies the protection of computer programs, treating them as literary works under the Berne Convention, and addresses rental rights.
- The agreement provides regulations for the safeguarding of trademarks, geographical indications, industrial designs, layout designs of integrated circuits, and undisclosed information. Additionally, it outlines rules pertaining to anti-competitive practices in contractual licenses.
- Developed nations were granted a one-year transition period from the WTO agreement's entry into force, while developing and transitional countries received five years (until January 2000), and least-developed countries (LDCs) were granted 11 years (until January 2006).
- The TRIPS agreement stands as the most comprehensive multilateral agreement on intellectual property (IP) to date.
- It is based on the primary conventions of the World Intellectual Property Organization (WIPO), with most provisions integrated from these conventions. However, the TRIPS agreement introduces additional obligations where modifications or enhancements to existing conventions are required.

GENERIC DRUGS AND COMPULSORY LICENSES

Generic drugs and compulsory licenses are critical components of the global pharmaceutical landscape, particularly in the context of ensuring access to affordable medicines. Let's delve deeper into each of these concepts:

Generic Drugs

Definition

Generic drugs are pharmaceutical products that are equivalent to brand-name drugs in terms of dosage form, safety, strength, route of administration, quality, and intended use.

They are produced after the patent protection of the original brand-name drug expires.

Key Characteristics

Cost-Effectiveness

Generic drugs are generally more affordable than their brand-name counterparts, promoting accessibility for a larger population.

Bioequivalence: Generic drugs must demonstrate bioequivalence to the innovator drug, ensuring similar efficacy and safety profiles.

Role in Healthcare

Access to Medicines

Generic drugs play a crucial role in expanding access to essential medicines, especially in developing countries where affordability is a significant concern.

Competition: The introduction of generic alternatives fosters competition in the pharmaceutical market, contributing to reduced prices.

Compulsory Licenses

Definition

A compulsory license is a legal authorization granted by a government or a competent authority to produce, use, or sell a patented invention without the consent of the patent holder.

It is an important tool to balance intellectual property rights with public health needs.

Key Characteristics

Public Health Emergencies: Compulsory licenses can be issued during public health crises to ensure the availability of essential medicines.

Affordability: They are often utilized to address situations where patented medicines are priced beyond the reach of a significant portion of the population.

Global Framework (TRIPS Agreement)

The Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, administered by the World Trade Organization (WTO), allows member countries to issue compulsory licenses for public health reasons.

Intersection of Generic Drugs and Compulsory Licenses

Compulsory licenses are often used to facilitate the production of generic versions of patented drugs, ensuring a more affordable supply.

Global Health Crises

During pandemics or health emergencies, governments may resort to compulsory licenses to enable the widespread production of generic drugs for the rapid and cost-effective treatment of affected populations.

Controversies and Challenges

The use of compulsory licenses can lead to controversies and legal battles, as pharmaceutical companies may contest such measures.

Striking a balance between protecting intellectual property rights and addressing public health needs remains a challenge.

WTO and TRIPS Flexibilities

The TRIPS Agreement recognizes the flexibility of member countries to implement measures, including compulsory licenses, to protect public health. This allows governments to prioritize the well-being of their citizens.

WTO-DOHA DEVELOPMENT AGENDA

The Doha Development Round, also known as the Doha Development Agenda, is a World Trade Organisation trade negotiation round that began in November 2001 under then-director-general Mike Moore. Its goal was to lower trade barriers all around the world, allowing for more global trade.

What is Doha Development Agenda?

In 2001, a ministerial-level conference in Doha, Qatar launched the Doha Agenda. The goal was to prioritise the needs of developing countries. The summit was primarily convened to address the problems of emerging countries. Trade facilitation, services, rules of origin, and dispute resolution are among the primary topics explored. The issue of differentiated and special treatment for developing countries was also raised as a serious concern.

Key Negotiation Topics in the Doha Round

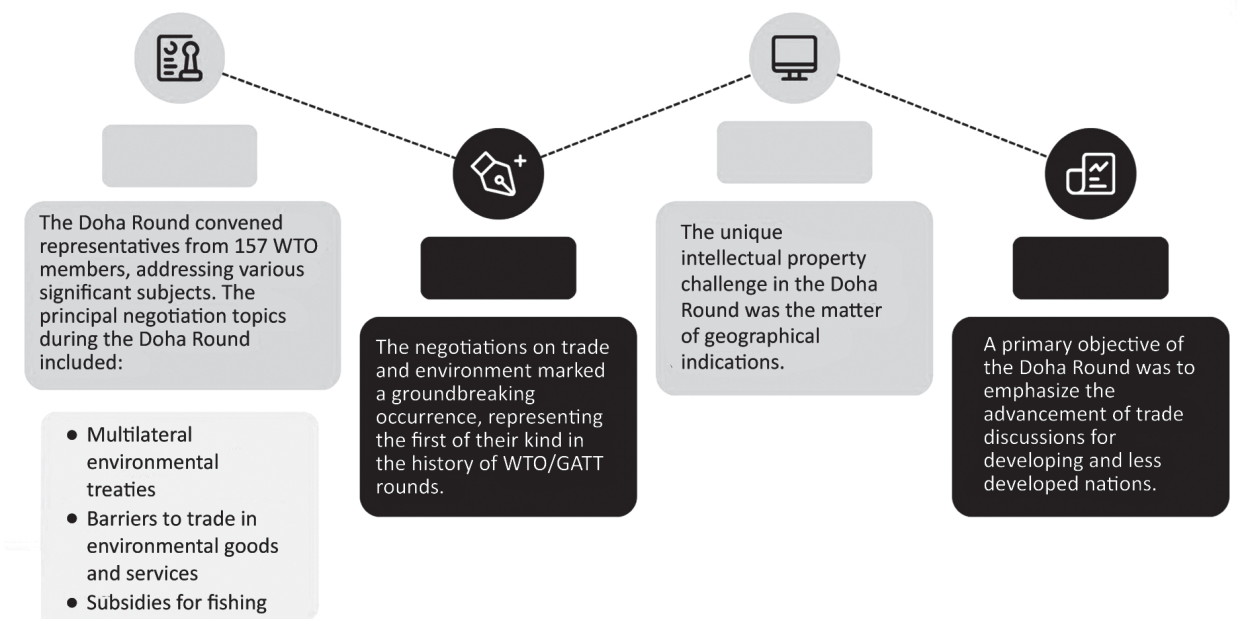

The Doha Round convened representatives from 157 WTO members, addressing various significant subjects. The principal negotiation topics during the Doha Round included:
Multilateral environmental treaties
Barriers to trade in environmental goods and services
Subsidies for fishing
The negotiations on trade and environment marked a groundbreaking occurrence, representing the first of their kind in the history of WTO/GATT rounds.
The unique intellectual property challenge in the Doha Round was the matter of geographical indications.
A primary objective of the Doha Round was to emphasize the advancement of trade discussions for developing and less developed nations.

Fig. 19.10: Key Negotiation Topics in the Doha Round

Outcome of The Doha Round

The Doha Round negotiations reached an impasse as participating nations failed to reconcile their differences on trade negotiations, particularly due to substantial disagreements between developed and developing countries. The reasons behind the failure of the Doha Round are evident in the following points:

- Developed countries, including the EU, the United States, Canada, and Japan, clashed with developing nations such as India, Brazil, China, and South Africa over the Special Safeguard Mechanism (SSM).
- Despite a brief resumption of Doha Round negotiations in Geneva in 2008, an agreement remained elusive, primarily due to the unresolved issues surrounding the Special Safeguard Mechanism.
- Negotiations initiated in Geneva in 2008 were terminated due to disputes over agricultural trade involving the United States, India, and China.
- The Doha discussions, which extended to ministerial conferences, failed to establish an agreement, with the breakdown of the Cancun negotiations being particularly noteworthy.
- The Special Safeguard Mechanism (SSM) and Special Agricultural Safeguard (SSG), specified in the Uruguay Round, presented challenges for many developing nations as its use was limited to items where non-tariff barriers had been converted to equivalent tariff barriers.

India in Doha Round

The Following was India's Stance on The Issue

- It backed the Special Safeguard Mechanism (SSM) to protect its farmers from an influx of imports.
- It supported the Doha Round's development agenda for poor countries and encouraged all countries to do the same.
- The administration emphasised the importance of the Doha Round's successful conclusion and the desire for wealthy countries to make additional market-opening pledges.
- India also wanted affluent countries to cut their 'trade-distorting' farm subsidies considerably.
- India needs a long-term solution to the problem of public food stockpiles in developing countries for food security reasons.
- It advocates for developing countries to have duty-free and quota-free market access.
- India has always opposed expanding the multilateral trading system in the direction of negotiating and implementing multilateral accords on investment, competition policy, and government procurement, as suggested by the 1996 Singapore Ministerial Declaration.
- During the Doha Round, India's then-Commerce and Industry Minister emphasised the necessity for the WTO accords to reflect the current development deficit, as well as the inequalities in the Uruguay Rounds and the TRIPS agreement.
- It stated that geographical indication IPR protection should not be confined to wine and spirits, but should be expanded to encompass other products as well (such as Basmati rice).
- It advocated for limits on the use and misuse of biological and genetic resources, as well as traditional knowledge.

Doha Round and Related WTO Ministerial Conferences

WTO Year	Ministerial Conference	Objectives
2003	Cancun	The major goal was to assess progress in talks and other Doha Development Agenda initiatives.
2004	Geneva	The primary goal was to get the negotiations and the remainder of the work schedule back on track.
2005	Paris	The primary goal was to create a tangible transition mechanism to the Doha Round negotiations.
2005	Hong Kong	The major aim was to put out the Doha Round's planned completion date till the end of 2006.
2006	Geneva	The primary goal was to secure a deal on agriculture subsidies and import levies.
2007	Potsdam	The Doha Round discussions came to a halt during a meeting in Potsdam due to a serious deadlock between the United States, the European Union, India, and Brazil.
2008	Geneva	Issues about agricultural trade between the United States, India, and China caused the failure of discussions that began in Geneva in 2008.
2015	Nairobi	It is a set of six Ministerial Decisions dealing with cotton, agriculture issues relating to the Least-Developed Countries (LDCs).
2017	Buenos Aires, Argentina	The objectives of the conference were to remove barriers to the International Trade Agreement with the member nations, achieve global economic development through optimum utilization of resources, increase market share of developing countries through assistance in their development efforts, and follow a non-discriminatory policy for all member countries.

WTO MINISTERIAL CONFERENCE 2022

Major Outcomes

The 12th Ministerial Conference of the World Trade Organization (WTO) was held in Geneva from June 12 to June 16, 2022. The conference resulted in a package of declarations and decisions on a variety of issues.

Here are Some of The Major Outcomes of The Conference

- **E-commerce:** The members agreed to maintain their current practice of not imposing customs duties on electronic transmissions until MC-13, which is expected to be held by December 31, 2023. Members also committed to reinvigorating efforts under the Work Programme on Electronic Commerce and intensify discussions on the moratorium including with respect to its scope, definition, and impact on customs duties.
- **Food Security:** The members formally adopted the Draft Ministerial Declaration on Emergency Responses to Food Insecurity and the Draft Ministerial Declaration on World Food Programme Food Purchases Exemption from Export Prohibitions or Restrictions. According to these declarations, any emergency measures introduced to address food security concerns shall minimize trade distortions as far as possible, be temporary, targeted, and transparent, and be notified and implemented in accordance with WTO rules.

Issues Raised by India

India participated in the Twelfth World Trade Organization (WTO) Ministerial Conference held in Geneva from 12-17 June 2022. India played an active role in the negotiations and contributed to the outcome package, which included decisions on various issues such as fisheries subsidies, the WTO response to the pandemic, food insecurity, e-commerce, and more. Here's a brief summary of India's stance on some of the issues:

- **E-commerce:** As part of the Ministerial Decision on the Work Programme on electronic commerce, WTO members agreed to maintain their current practice of not imposing customs duties on electronic transmissions and to intensify discussions among members on this topic. The moratorium will remain in effect until MC13 due to be held by the end of 2023 or until 31 March 2024 should MC13 be delayed beyond that date.
- **Fisheries subsidies:** After negotiations for 21 years, WTO members agreed on an Agreement on Fisheries Subsidies which sets new global rules to curb harmful subsidies and protect global fish stocks in a manner that also recognizes the needs of fishers in developing and least-developed countries (LDCs). The agreement prohibits support for **Illegal, Unreported and Unregulated (IUU)** fishing. It bans support for fishing in overfished stocks. The agreement also seeks to curb subsidies for overcapacity and overfishing by ending subsidies for fishing on the unregulated high seas.
- **TRIPS:** In response to the ongoing impact of COVID-19, members adopted a Ministerial Declaration on the WTO response to the current and future pandemics which provides a template aimed at faster and globally coordinated response for future Pandemics without altering the existing rights and obligations of WTO Members. This includes a waiver of certain requirements under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) concerning the use of compulsory licences to produce COVID-19 vaccines.
  - In parallel, a Ministerial Decision on the TRIPS Agreement provides a platform for members to work together to diversify vaccine production capacity. As per the decision, Members will have greater scope to take direct action over the next five years to override the exclusive effect of patents through a targeted waiver that addresses specific problems identified during the pandemic, especially facilitating and streamlining vaccine exports.

FREE TRADE AGREEMENT

A Free Trade Agreement (FTA) refers to a pact between two or more nations aimed at diminishing trade barriers in both imports and exports. These accords involve the negotiation of tariffs and duties imposed on imports, with the ultimate goal of reducing obstacles to trade and bolstering bilateral or multilateral trade relationships.

Under an FTA, the exchange of goods and services across international borders occurs with minimal or no government tariffs, quotas, or subsidies. Essentially, a free-trade policy is characterized by the absence of trade restrictions. The concept of an FTA stands in contrast to trade protectionism or economic isolationism.

In the contemporary global landscape, pursuing a free-trade policy typically involves the formal and mutual agreement of the participating nations.

Classification of Trade Agreements

Based on The Level of Openness in The Trade Between The Countries, Free Trade Policies Can Be Categorized As

- **Preferential Trade Agreement (PTA):** Two or more nations agree to reduce duties on specific products, creating preferential entry rights. A positive list specifies eligible products, as seen in examples like India – MERCOSUR PTA and India – SAARC SAPTA.
- **Free Trade Agreement (FTA):** Multiple countries in an FTA eliminate tariffs on key bilateral trade items. Unlike PTAs, FTAs use a negative list, excluding certain products and services. Examples include India–SAFTA and India-Sri Lanka FTA.

- **Comprehensive Economic Cooperation Agreement (CECA):** CECA encompasses agreements on goods, services, investment, and more. Examples are India-Singapore CECA and India-Malaysia CECA.
- **Customs Union (CU):** Members trade duty-free internally, maintaining common tariffs externally. Examples include the EU Customs Union and the Southern African Customs Union.
- **Common Market:** These allow free trade and unrestricted movement of labour and capital among member countries. Example: European Common Market.
- **Economic Union:** EU extends the Common Market with harmonized fiscal/monetary policies and shared institutions, as seen in the European Union (EU).

Significance of FTAs

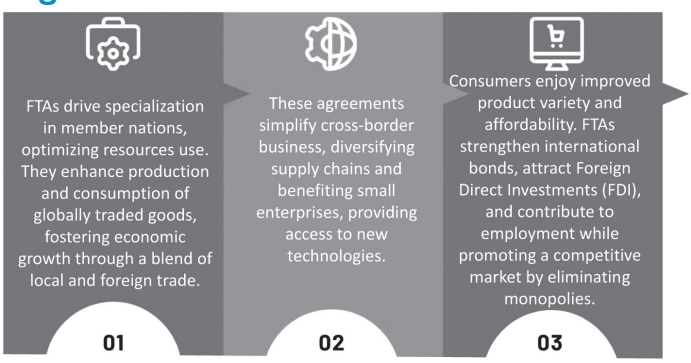

FTAs drive specialization in member nations, optimizing resources use. They enhance production and consumption of globally traded goods, fostering economic growth through a blend of local and foreign trade.
01
These agreements simplify cross-border business, diversifying supply chains and benefiting small enterprises, providing access to new technologies.
02
Consumers enjoy improved product variety and affordability. FTAs strengthen international bonds, attract Foreign Direct Investments (FDI), and contribute to employment while promoting a competitive market by eliminating monopolies.
03

Fig. 19.11: Significance of FTAs

Concerns Regarding FTAs

- The success of trade agreements hinges on the creation of new trade opportunities based on comparative advantage, which fosters both trade and economic growth. However, if an FTA redirects trade significantly from more competitive nations to its members, it can have an overall negative impact.
- Intellectual property rights face threats, as domestic products can be easily replicated by larger corporations.
- The loss of revenue in the form of import duties and tariffs is a significant drawback.
- The expansion of foreign corporations may lead to the exploitation of domestic resources and laborers.
- Increased dependence on other countries for goods and services is a potential consequence.
- The free movement of foreign goods can adversely affect domestic industries, resulting in losses for indigenous producers.

REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP

RCEP is a regional free trade agreement. It complements and builds upon Australia's existing free trade agreements with 14 other Indo-Pacific countries.

The RCEP was conceived at the 2011 ASEAN Summit in Bali, Indonesia. The negotiations were formally launched during the 2012 ASEAN Summit in Cambodia. India was part of the negotiations since its initial negotiations. However, it later decided to opt out and not join the bloc. The Treaty was formally signed on 15th November 2020 at the virtual ASEAN Summit hosted by Vietnam, without India being its member. As of January 2022, seven of the 10 Asian nations and 5 non-ASEAN signatories have deposited their instruments of ratification with the secretary general of ASEAN. For the 10 ratifying countries, the trade pact took effect on 1 January 2022.

RCEP Objective

The fundamental aim for initiating and safely negotiating the RCEP was to establish a contemporary, high-quality, comprehensive, and mutually beneficial economic partnership agreement. This agreement would encompass various aspects, including trade in goods, services, investment, economic and technical cooperation, intellectual property, competition, electronic commerce, dispute settlement, and other related issues.

Significance of RCEP for India

- RCEP aligns with India's Act East Policy, contributing to the expansion of India's economic influence in the neighbouring and extended regions.
- Increased economic integration with Southeast Asian and East Asian countries is assured through RCEP, offering India access to extensive regional markets and facilitating the generation of foreign exchange.
- India can capitalize on its strengths in areas like healthcare, education, and IT-enabled services, enabling market expansion and attracting higher foreign direct investment (FDI).
- RCEP serves as a catalyst for India's Micro, Small, and Medium Enterprises (MSMEs) to seamlessly integrate into global value chains.
- The agreement complements India's existing free trade agreements with ASEAN nations, fostering a more cohesive regional economic landscape.

India's Concerns Regarding RCEP

Despite participating in the initial negotiations, India has chosen to withdraw from the final agreement due to several concerns, including:

- **Tariff Barriers:** India has expressed dissatisfaction with tariff barriers, especially evident in bilateral free trade agreements like the India-ASEAN agreement.
- **Non-Trade Issues:** Concerns were raised about non-trade issues such as environmental and labor standards. Some member nations advocated for stringent labor and environmental protection laws, which India believed

could surpass the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

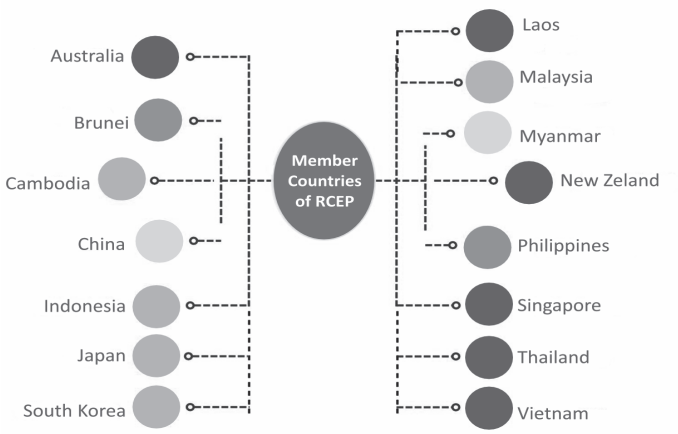


Fig. 19.12: RCEP Member Countries

- **Market Opening:** India was wary of opening its markets to cheaper goods from countries like China and South Korea, given the existing trade deficit with 11 RCEP nations.
- **Rules of Origin:** India sought stringent rules of origin to prevent the influx of Chinese goods through member countries with lower or no duty levels, such as the South Asia Free Trade Pact and the duty-free quota-free arrangement from Bangladesh.
- **E-commerce Inclusion:** India expressed reservations about including e-commerce in the RCEP talks.
- **Data Localization:** The RCEP draft opposed data localization, while India expressed concerns about the digital giants' monopoly.
- **Value Addition:** India emphasized the need for the highest value addition with indigenous inputs in the country before exporting a product.
- **Comprehensive Agreements:** India insisted on adopting agreements on services and investments alongside any trade-in-good agreement, emphasizing the interconnectedness of these aspects.

INTERNATIONAL MONETARY FUND

The IMF originated from the **Bretton Woods Conference in 1944, officially commencing operations on December 27, 1945**, with 29 member countries committed to the treaty. Today, the IMF, headquartered in Washington D.C., comprises **189 member countries and serves as a specialized agency of the UN.**

- **Key functions of the IMF include:**
  - Fostering Global Monetary Cooperation
  - Securing Financial Stability
  - Facilitating and Promoting International Trade, Employment, and Economic Growth Worldwide
- The International Monetary Fund (IMF) has released several reports on various topics, including the economy, infrastructure, and social development. One of the most prominent reports released by the IMF is the **World Economic Outlook (WEO)**. The WEO is a survey by the IMF staff that is usually published twice a year. It presents IMF staff economists' analyses of global economic developments during the near and medium term.

The functions of the International Monetary Fund can be categorized into three types:

- **Regulatory functions:**
  - IMF functions as a regulatory body and as per the rules of the Articles of Agreement, it also focuses on administering a code of conduct for exchange rate policies and restrictions on payments for current account transactions.
- **Financial functions:**
  - IMF provides financial support and resources to the member countries to meet short-term and medium-term Balance of Payments (BOP) disequilibrium.
- **Consultative functions:**
  - IMF is a centre for international cooperation for the member countries. It also acts as a source of counsel and technical assistance.

The Objective of The IMF

- To improve and promote global monetary cooperation of the world.
- To secure financial stability by eliminating or minimizing the exchange rate stability.
- To facilitate a balanced international trade.
- To promote high employment through economic assistance and sustainable economic growth.
- To reduce poverty around the world.

Board of Governors

- Each member country appoints a governor and an alternate governor to the Board of Governors. This body is tasked with crucial responsibilities, including the selection of executive directors to the Executive Board, approval of quota increases, allocations of Special Drawing Rights, admission of new members, compulsory withdrawal of members, and amendments to Articles of Agreement and By-Laws. The Board of Governors convenes annually during the IMF-World Bank Annual Meetings and receives advice from two ministerial committees: the International Monetary and Financial Committee (IMFC) and the Development Committee.
- The Board of Governors of the IMF consists of one Governor and one Alternate Governor from each member country. For India, the Finance Minister is the ex-officio Governor on the Board of Governors of the IMF, and the Governor of the **Reserve Bank of India (RBI)** is the Alternate Governor.

- **Ministerial Committees:**
  - **International Monetary and Financial Committee (IMFC):**
    - It comprises of 24 members representing all member countries, the IMFC discusses the management of the international monetary and financial system.
    - It addresses proposals to amend the Articles of Agreement and other global economic concerns.
  - **Development Committee:**
    - This joint committee, with 25 members from the Boards of Governors of the IMF and the World Bank, offers guidance on economic development in emerging market and developing countries.
    - Serving as a platform for building intergovernmental consensus on critical development issues.
  - **Executive Board:** The 24-member Executive Board, elected by the Board of Governors, oversees the day-to-day operations of the IMF.

Special Drawing Rights (SDR)

SDR, established by the IMF in 1969 as an international reserve asset, serves to supplement the official reserves of its member countries. Allocations of SDR, totalling SDR 660.7 billion (approximately US$943 billion) to date, aim to address long-term global reserve needs and assist nations in managing the impact of the Covid-19 pandemic. The SDR's value is determined by a basket of five currencies: the U.S. dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling. The composition of the SDR basket undergoes review every five years, with the last review in November 2015 resulting in the inclusion of the Chinese renminbi (RMB) based on meeting the criteria set by the Board.

IMF and India

- International oversight by the IMF in monetary matters has significantly contributed to the expansion of global trade, with India reaping the benefits of these positive outcomes.
- During the post-partition era, India faced substantial balance of payments deficits, especially with the dollar and other hard currency countries. The IMF played a crucial role in alleviating India's financial challenges, providing loans to address the Indo–Pak conflicts of 1965 and 1971.
- From the establishment of the IMF until March 31, 1971, India acquired foreign currencies totalling ₹ 817.5 crores from the IMF, all of which have been fully repaid.
- Since 1970, India, like other IMF member countries, has accessed increased assistance through the creation of Special Drawing Rights (SDRs).
- During times of economic challenges, such as rising import prices for food, fuel, and fertilizers, India turned to the IMF for financial support.
- In 1981, India received a substantial loan of approximately Rs. 5,000 crores to overcome a foreign exchange crisis resulting from a persistent deficit in the balance of payments on the current account.
- With the balance of payments severely affected by the oil price escalation since October 1973, the IMF established a special fund to provide India with oil facilities.
- In the early 1990s, facing unsatisfactory foreign exchange reserves, India secured an emergency loan of $2.2 billion from the IMF by pledging 67 tons of gold reserves as collateral security. In return, India committed to implementing structural reforms.

Criticisms of The IMF

- **Conditional Loans:** Economic policies attached to loans may worsen economic situations.
- **Structural Adjustments:** Policies like privatization and deregulation can be detrimental.
- **Exchange Rate Reforms:** Criticized for inadequate understanding and blanket reforms.
- **Devaluations:** Historical criticism for permitting inflationary devaluations.
- **Neo-Liberal Policies:** Concerns about privatization leading to private monopolies.
- **Free Market Criticisms:** Interventionist approach conflicts with free-market principles.
- **Moral Hazard:** Bailing out countries may encourage further borrowing.
- **Lack of Transparency:** Accusations of imposing policies without proper consultation.
- **Supporting Dictatorships:** Criticized for backing military dictatorships in some cases.

WORLD BANK

The World Bank was established in 1944 at the Bretton Woods Conference, held in Bretton Woods, New Hampshire, USA.

The formal agreement establishing the International Bank for Reconstruction and Development (IBRD), the initial institution of the World Bank Group, was signed on July 1, 1944. The World Bank officially began operations in 1946. Its original purpose was to provide financial and technical assistance for the reconstruction of war-torn Europe and the economic development of other developing countries. Over the years, the focus of the World Bank has evolved to address a broader range of development challenges, with an emphasis on poverty reduction and sustainable development.

World Bank Group Institutions	Function
International Bank for Reconstruction and Development (IBRD)	Provides loans to middle-income and creditworthy low-income countries to finance a wide range of development projects, such as infrastructure, education, healthcare, and economic development.
International Development Association (IDA)	Offers concessional loans and grants to the world's poorest countries to support projects and programs that aim to reduce poverty, improve living conditions, and promote sustainable development.
International Finance Corporation (IFC)	Focuses on supporting private sector development in developing countries by providing investment, advisory services, and facilitating partnerships to promote economic growth and job creation.
Multilateral Investment Guarantee Agency (MIGA)	Provides political risk insurance and credit enhancement to encourage foreign investment in developing countries, thereby mitigating risks for investors and supporting economic growth.
International Centre for Settlement of Investment Disputes (ICSID)	Provides facilities for the arbitration and conciliation of investment disputes between governments and foreign investors, promoting a fair and neutral forum for resolving such disputes.

Together, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) form the World Bank.

Each institution within the World Bank Group plays a specific role in contributing to the overarching goal of reducing poverty and promoting sustainable development in member countries.

- The World Bank releases several reports on various topics, including the economy, infrastructure, and social development. Major reports released by World Bank are:
  1. Ease of Doing Business Report (Stopped Publishing)
  2. World Development Report
  3. Global Economic Prospects Report
  4. Remittance Report
  5. Ease of Living Index
- The **current President of the World Bank** is **Ajay Banga**, an Indian-American businessman and former CEO of Mastercard. He was appointed as the World Bank's 14th president on May 3, 2023, and his term will begin on June 2, 2023.

Organization and Structure

- The World Bank is related to the UN, though it is not accountable either to the General Assembly or to the Security Council
- Each of the bank's more than 180 member states is represented on the board of governors, which meets once a year.
- The governors are usually their countries' finance ministers or central bank governors.
- Although the board of governors has some influence on IBRD policies, actual decision-making power is wielded largely by the bank's 25 executive directors.
- Throughout the World Bank's history, the bank president, who serves as chairman of the Executive Board, has been an American citizen.
- Voting power is based on a country's capital subscription, which is based in turn on its economic resources.
- Thus, the wealthier and more developed countries constitute the bank's major shareholders and thus exercise greater power and influence.
- The bank obtains its funds from the capital subscriptions of member countries, bond flotations on the world's capital markets, and net earnings accrued from interest payments on IBRD and IFC loans.

World Bank and India

- India's collaboration with the World Bank traces back to the establishment of the International Bank for Reconstruction and Development (IBRD) in 1944. In November 1948, India secured its inaugural bank loan of US$34 million from the IBRD for railway rehabilitation. Throughout the 1950s, the IBRD remained India's exclusive source of World Bank borrowings.
- In the 1960s and 1970s, the International Development Association (IDA) became a significant contributor, constituting nearly three-fourths of all World Bank lending to India. India emerged as the primary recipient of IDA funds, accounting for over two-fifths of its total lending.
- The lending landscape underwent a significant shift following the macroeconomic crisis of 1991. India transitioned to becoming one of the last major borrowers, engaging in structural adjustment lending.
- Presently, the World Bank Group (WBG) has sanctioned a commitment plan of $25-30 billion for India spanning the years 2019-2022.

ASIAN INFRASTRUCTURE INVESTMENT BANK (AIIB)

The Asian Infrastructure Investment Bank (AIIB) is an international financial institution focused on supporting the building of infrastructure in the Asia-Pacific region. It was established to address the expanding infrastructure needs across Asia, aiming to foster sustainable economic development, create wealth, and improve infrastructure connectivity.

AIIB began operations in 2016 with 57 founding Members (37 regional and 20 nonregional) and Headquarters located in Beijing. By the end of 2020, AIIB had 103 approved Members representing approximately 79 percent of the global population and 65 percent of global GDP.

Objectives of AIIB

- **Facilitate Sustainable Economic Development:**
  - Foster sustainable economic development, generate wealth and enhance infrastructure connectivity in Asia through investments in productive sectors.
- **Promote Regional Cooperation:**
  - Actively promote regional cooperation and partnerships to address development challenges by closely collaborating with other multilateral and bilateral development institutions.
- **Encourage Investment in Public and Private Capital:**
  - Promote investment in both public and private capital for developmental purposes, with a particular emphasis on infrastructure and other productive sectors.
- **Optimize Resource Utilization:**
  - Utilize available resources for financing development in the region, prioritizing projects and programs that contribute most effectively to the harmonious economic growth of the region.
- **Support Private Investment:**
  - Encourage private investment in projects, enterprises, and activities that contribute to economic development in the region, especially when private capital is not available on reasonable terms and conditions.

Governance of AIIB

Who can be a Member of AIIB?

- Membership in the AIIB is open to all members of the World Bank or the Asian Development Bank and is divided into regional and non-regional members.
- Regional members are those located within areas classified as Asia and Oceania by the United Nations.
- Unlike other MDBs (multilateral development banks), the AIIB allows for non-sovereign entities to apply for AIIB membership, assuming their home country is a member.
- Thus, sovereign wealth funds (such as the China Investment Corporation) or state-owned enterprises of member countries could potentially join the Bank.

Cooperation between AIIB and India

India, as one of the founding members of the Asian Infrastructure Investment Bank (AIIB), holds a 7.6% share in the multilateral development bank, following China, which has the largest share at 26.6%.

With 14 projects totaling USD 4.35 billion approved, India has secured the highest amount of financing from the AIIB.

India emphasizes that the AIIB operates as a non-political institution, respecting the sovereignty of its member states and refraining from interference in their internal affairs.

China Factor

- Persistent issues between India and China include disputes over Indian membership in the Nuclear Suppliers Group and territorial conflicts in the Himalayas.
- Concerns also arise from the China-Pakistan Economic Corridor traversing disputed territory in Kashmir.
- Despite these challenges, AIIB serves as a platform for implicit consensus building between India and China.

Economic Contribution

- India is the largest recipient of AIIB financing for infrastructure projects, with approval for five projects.
- Projects include the Bangalore Metro Rail Project, Transmission System Strengthening Project, Gujarat Rural Roads (MMGSY) Project, India Infrastructure Fund, and Andhra Pradesh 24x7 – Power For All project.
- The total loan sanctioned for these Indian projects amounts to USD 1.074 billion, constituting nearly 28% of AIIB's total lending for 24 global infrastructure projects.
- AIIB has approved USD 200 million for the National Investment and Infrastructure Fund (NIIF), contributing to India's long-term infrastructure capital.
- The AIIB and the Government of India signed a USD 455 million loan in February 2019 for the Andhra Pradesh Rural Roads Project, connecting over 3,300 habitations and benefiting around two million people.

ASIAN DEVELOPMENT BANK (ADB)

- Established on December 19, 1966, the Asian Development Bank (ADB) is a regional development bank dedicated to fostering economic and social advancement in Asia and the Pacific. With **68 members,** 49 from the Asia-Pacific region and 19 from other areas, the bank's headquarters is situated in Manila, Philippines.
- **India, a founding member, currently holds the fourth-largest share in ADB**. As of December 31, 2020, Japan and the United States possess the largest shares at 15.571% each. China holds 6.429%, India 6.317%, and Australia 5.773%.

- The distribution of ADB's shares aligns with the economic size of its member countries. The bank's capital is divided into shares, and each member's share allocation is determined by the magnitude of its economy. Consequently, countries with larger economies hold more shares in the bank.
- ADB actively publishes reports covering diverse topics such as the economy, infrastructure, and social development. Notable reports released by ADB:

  Asian Development Outlook is an annual publication (available online and in print) produced by the Asian Development Bank (ADB). It offers economic analysis and forecasts, as well as an examination of social development issues, for most countries in Asia.

NEW DEVELOPMENT BANK

- The New Development Bank (NDB) was **established in 2014 by the BRICS countries: Brazil, Russia, India, China, and South Africa**.
- The NDB's initial authorized capital is USD 100 billion, divided into one million shares with a par value of one hundred thousand dollars each. NDB's founding members made an initial subscription of five hundred thousand shares totaling USD 50 billion, which include one hundred thousand shares corresponding to a paid-in capital of USD 10 billion and four hundred thousand shares corresponding to a callable capital of USD 40 billion. The initial subscribed capital was equally distributed amongst the founding members.
- Membership of the Bank is open to members of the United Nations, and it is open to borrowing and non-borrowing members.
- The voting power of each member is equal to its subscribed shares in the capital stock of the Bank. Currently, all the members have equal voting rights.
- Originally known as the BRICS Development Bank, its formation was conceptualized during the 4th BRICS Summit in New Delhi in 2012.
- The official treaty for the NDB's creation was signed during the 6th BRICS Summit in Fortaleza, Brazil, in 2014.
- The NDB focuses on financing sustainable development and infrastructure projects in BRICS member nations and other emerging economies.
- The Fortaleza Declaration outlined the NDB's role in strengthening cooperation among BRICS members.
- It provides financial support for both public and private projects through various means.
- Its headquarters are in Shanghai, China, the NDB has regional offices in all BRICS member countries except India.
- In 2018, the NDB obtained 'Observer' status at the United Nations General Assembly.
- In 2021, the NDB admitted four new members: **Bangladesh, Egypt, the United Arab Emirates (UAE) and Uruguay**. These are the first new members to join the NDB since its inception, bringing its total membership to nine countries.
- The admission of new members is expected to enhance the NDB's capacity to mobilize resources, diversify its portfolio, expand its geographical reach and impact, and strengthen its role as a premier development institution for emerging economies.

Objectives of NDB

- The primary objective of the New Development Bank is to provide financing for infrastructure development projects in emerging economies.
- NDB functions as an alternative to the World Bank and the International Monetary Fund (IMF), offering different interest rates.
- The institution aims to enhance financial cooperation among the countries that are signatories to its establishment.
- It strives to establish a comprehensive network of global partnerships with other multilateral development institutions.
- The promotion of infrastructural and sustainable development projects is a key goal of the NDB.
- The NDB aims to maintain a balanced project portfolio, considering factors such as financial requirements, geographic location, and more.

The New Development Bank (NDB) is a multilateral development bank established by the BRICS countries (Brazil, Russia, India, China, and South Africa) in 2014. The NDB supports infrastructure and sustainable development projects in alignment with the development objectives of its members and their commitments under the SDGs and the Paris Agreement1.

As of August 2021, the NDB has approved 14 Indian projects for an amount of nearly USD 4.2 billion. **Some of the major infrastructure projects funded by NDB in India include:**

- Mumbai Metro rail
- Delhi-Ghaziabad-Meerut Regional Rapid Transit System
- Renewable Energy projects

CONCLUSION

International financial institutions play a complex role, both fuelling global growth and facing criticism for inequities. While providing vital loans and promoting development, their influence on policy and power imbalances raise concerns. Adapting governance, embracing inclusivity, and mitigating crises will be crucial in shaping their future role in a stable and equitable global financial system.

SDG and Climate Change

20

INTRODUCTION

Rising development brings environmental challenges which demands global, holistic solutions, birthing the green economy and sustainable development. The UN Environment defines the **Green Economy** as enhancing well-being equity while curbing environmental risks and scarcities, emphasizing low carbon and resource efficiency. **Sustainable development** aims to meet present needs without endangering the future needs of future generations, ensuring a better environment for generations to come, independent of past inheritances.

- Climate change and sustainable development are intricately connected through their mutual influence on society and the environment.
- Sustainable development comprises three primary components: Social, economic, and environmental aspects.
- **Sustainable Development Goal 13,** known as climate action, strives to mitigate the effects of climate change by improving education and raising awareness about its impacts.

Climate change is the significant variation of average weather conditions becoming, warmer, wetter, or drier over several decades or longer. It is the longer term trend that differentiates climate change from natural weather variability.

BRUNDTLAND COMMISSION AND OUR COMMON FUTURE

- In 1983, The Brundtland Commission, also referred to as the **World Commission on Environment and Development (WCED)**, was assembled by the UN General Assembly.
- A global assembly of environmental experts, politicians, and government officials came together to seek sustainable solutions for addressing environmental challenges.
- **Report published:** In 1987, it published the report **"Our Common Future"**.
- In this report, it defined sustainable development as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs".
- The report urged the UN to set up the **UN Program of Action on Sustainable Development** to execute the instructions outlined in the report.
- The report also set the groundwork for the **Rio Summit,** convened in **Rio De Janeiro in 1992**, which subsequently led to the establishment of the **UN Commission on Sustainable Development** during the same year.
- However, **Critics** have pointed out specific shortcomings in the concept:
  - The broadness or ambiguity, sparking extensive debates on what aspects of development truly fit the criteria for "sustainability."
  - The absence of quantifiable or objectively assessable objectives.
  - The presumption that industrialization and economic growth are both inevitable and desirable.
  - The failure to decisively prioritize either human necessities or environmental obligations, both of which might hold greater significance in varying contexts.
- Despite facing extensive criticism, sustainable development has become a central aspect of both national and international policymaking, notably within United Nations agencies. In 2015, the United Nations General Assembly approved the 2030 Agenda for Sustainable Development, encompassing 17 comprehensive objectives aimed at establishing a globally fair society in tandem with a flourishing environment.

THE EARTH SUMMIT

- In June 1992, representatives from 178 nations convened in **Rio de Janeiro** to establish it. This event is also referred to as **the United Nations Conference on Environment and Development.**
- **Objective:** To prioritize sustainable development and devise a shared action plan aimed at halting environmental deterioration.
- The 'Earth Summit' affirmed that achieving sustainable development was an achievable aim for all individuals worldwide, whether at local, national, regional, or international levels.
- It acknowledged the crucial necessity of harmonizing economic, social, and environmental considerations to sustain human life on Earth, emphasizing the possibility of an integrated approach.
- Additionally, it recognized the need for new perspectives on production, consumption, lifestyle, and decision-making, marking a groundbreaking idea that spurred active discussions among governments and between governments and their populations about ensuring sustainable development.

- **Contributions:** An Action Plan, recognized as **"Agenda 21,"** was formulated concerning sustainable development. Agenda 21 was:
  - A bold action plan advocating for fresh approaches to invest in the future, aiming to accomplish comprehensive sustainable development in the 21st century.
  - Its suggestions spanned from innovative educational approaches to novel methods of conserving natural resources and engaging in a sustainable economy.
- **Reports published:** The **"Forest Principles,"** a non-legally binding document, was introduced to promote the conservation of forests.
- The **Rio Declaration on Environment and Development** resulted from the Earth Summit.
- **Some important legally binding documents, such as** the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD), were signed.

MILLENNIUM SUMMIT AND THE UNITED NATIONS MILLENNIUM DECLARATION

- The Millennium Summit, held in September 2000 at United Nations Headquarters in New York, was, at that time, the largest gathering of heads of state and government of all time.
- At the summit, **189 nations adopted** the Millennium Declaration, which was **signed by 147 heads** of state and governments.
- **Objective:** During the Summit, global leaders pledged to combat poverty, hunger, gender inequality, environmental degradation, HIV/AIDS and simultaneously enhance access to education, healthcare, and clean water by 2015.
- During the United Nations Millennium Summit in September 2000, world leaders endorsed eight concrete and quantifiable development objectives, eventually termed the **Millennium Development Goals (MDGs)**. These goals encompassed 18 targets and 48 indicators to assess outcomes, with a deadline set for 2015.

Millennium Development Goals:

- Goal1- Eradicate extreme poverty and hunger
- Goal 2-Achieve universal primary education
- Goal 3-Promote gender equality and empower women
- Goal 4- Reduce child mortality
- Goal 5- Improve maternal health
- Goal 6-Combat HIV/AIDS, Malaria and other diseases
- Goal 7- Ensure environmental sustainability
- Goal 8-Develop a Global Partnership for Development

- The **achievements** shown by the final MDG report 2015 are as follows:

The conclusive MDG report affirms that establishing goals has the potential to elevate millions from poverty, empower women and girls, enhance health and overall welfare, and open up extensive opportunities for improved livelihoods.

- The count of individuals residing in **extreme poverty has decreased by over fifty percent,** dropping from 1.9 billion in 1990 to 836 million in 2015.
- Between 1991 and 2015, the population of individuals within the working middle class, those earning more than $4 per day nearly tripled.
- The **percentage of undernourished individuals** in developing regions has decreased by almost half, **from 23.3% in 1990-92 to almost 12.9% in 2014-16.**
- The **number of out-of-school children of primary school age worldwide fell by almost half,** to an estimated 57 million in 2015, down from 100 million in 2000.
- **Most countries have achieved gender parity** in primary school.
- The **mortality rate of children under the age of five** has been **reduced by over fifty percent** since 1990.
- Globally, **maternal mortality has decreased by 45 percent** since 1990.
- Between 2000 and 2015, **more than 6.2 million deaths from malaria have been prevented.**
- There was an approximate **40 percent reduction in new HIV infections** between 2000 and 2013.
- As of June 2014, the global number of individuals receiving **antiretroviral therapy (ART) for HIV** reached 13.6 million, marking a significant surge from merely 800,000 in 2003.
- From 2000 to 2013, i**nterventions for tuberculosis prevention, diagnosis, and treatment are estimated to have preserved** around 37 million lives.
- **Improved sanitation** has been accessed by 2.1 billion people globally.
- The **MDG drinking water target has been achieved by 147 countries worldwide,** while the MDG sanitation target has been met by 95 countries, with 77 countries meeting both goals.
- Between 2000 and 2014, there was a 66 percent real-term increase in official development assistance from developed countries, reaching $135.2 billion.

RIO+20

- Rio+20, also termed as **the United Nations Conference on Sustainable Development**, took place in Rio De Janeiro, Brazil in 2012, marking two decades since the Rio Earth Summit of 1992.
- It reiterated the political dedication to sustainable development and its facets encompassing economic advancement, social betterment, and environmental safeguarding.
- **Objective:** It had the following objectives:
  - Reaffirm political backing for sustainable development.

- Assessing the outcomes of implementing decisions made at the Rio conference and identifying remaining gaps to be addressed.
- Addressing newly emerging and evolving issues.

- The focus will strongly prioritize integrating the **three pillars of sustainable development—economic, social, and environmental aspects**—accelerating implementation, and enhancing coherence among all stakeholders, including various sectors within the UN system.
- **Themes of Rio+20:**
  - Green economy about eradicating the poverty and promoting sustainability
  - Institutional framework for sustainable development
- **Significance of the Rio+20** is as follows:
  - The establishment of the **UN High-Level Political Forum (HLPF)** occurred in 2013.
  - The conference also made forward-looking decisions on seven key areas: Employment, energy, urban areas, food security, water resources, oceans, and disaster management.
- **Issues Discussed:** The primary focus of the official discussions revolved around two key themes: developing a green economy to attain sustainable development and alleviating poverty by aiding developing nations in adopting environmentally conscious developmental pathways, along with enhancing international coordination for sustainable development.
- **Challenges Faced by Rio+20** apart from the green economy concerning sustainable development and poverty elimination, as well as the structural setup for sustainable development, member States and other involved parties have outlined several pressing emerging issues for Rio+20 to tackle. These encompass:
  - Promoting green jobs and social integration.
  - Enhancing accessibility, efficiency, and sustainability in energy.
  - Ensuring food security and fostering sustainable agriculture.
  - Establishing effective water management practices.
  - Developing sustainable urban areas.
  - Overseeing ocean management.
  - Enhancing resilience and readiness for disasters.
- **Report:** The summit published its report **"The Future We Want"** in 2012.
- **Document Highlights Some Development Concerns:** Food security, eliminating poverty, ensuring clean water, mining, and more.
- **Achievements of Rio+20:** Rio+20 was a success with accomplishments as follows:
  - Many observers concur that Rio+20's significant achievement was establishing a process to create global **Sustainable Development Goals (SDGs)**. These goals will prioritize key sustainable development areas, encompassing both developed and developing nations.
  - The UN has highlighted multiple accomplishments, notably the commitment of over **$500 billion** towards sustainable development by governments, multilateral development banks, and the private sector during the conference.

IGNITE YOUR MIND

Do you think the combined efforts of the Earth Summit, the Brundtland Commission's concept of sustainable development, and the Rio+20 summit have significantly contributed to shaping a global framework for addressing environmental challenges, fostering sustainable development, and promoting international cooperation

Performance of India towards the MDG:

- India has shown commendable advancements in moving closer to achieving the MDGs, yet progress among the goals differs. Assisting less developed states to replicate the success of high-performing regions can enhance overall performance:
- India has successfully attained the goal of halving poverty (Goal 1).
- Gender parity in primary school enrollment (Goal 3) has been achieved, and it was nearing accomplishment in secondary and tertiary education by the end of 2015. Hunger has been decreased by fifty percent (Goal 1),
- Maternal mortality has seen a reduction of three-quarters (Goal 5),
- Efforts to manage diseases like HIV/AIDS, malaria, and tuberculosis have shown progress (Goal 6).
- Forest coverage has expanded, although there has been a shift toward timber production rather than a diverse product approach (Goal 7).
- The proportion of people lacking access to clean drinking water has been cut in half, but sanitation remains a significant challenge.
- India's strides in curbing greenhouse gas emissions appear satisfactory in terms of carbon intensity of GDP but less so in terms of CO_2 emissions per person

But also lagged behind in some areas as follows:

- Attaining universal primary school enrollment and completion, alongside achieving universal youth literacy (Goal 2);
- Empowering women through employment wages and participation in politics (Goal 3);
- Decreasing child and infant mortality rates (Goal 4);
- Enhancing access to proper sanitation to address the substantial issue of open defecation (Goal 7).

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK

- The United Nations initiated it in 2012 to encourage the execution of the Sustainable Development Goals (SDGs).
- **Objective:** SDSN promotes an integrated approach **to implement SDGs and the Paris Agreement on Climate Change** through education, research, policy analysis, and global cooperation.
- **World Happiness Report:**
  - **Published by:** The **United Nations Sustainable Development Solutions Network (SDSN)** annually.
  - It draws from a global survey spanning over 150 countries.
  - The report amalgamates individual assessments of happiness alongside economic and social data.
  - Six crucial elements—social support, income, health, freedom, generosity, and absence of corruption—are taken into account.
  - A happiness score is calculated by averaging data collected over a three-year duration.

SUSTAINABLE DEVELOPMENT GOALS

- In 2015, at the United Nations headquarters in New York, 193 heads of states and other UN leaders convened for a summit and collectively adopted the Sustainable Development Goals (SDGs).
- **Objective:** The SDGs represent a united endeavor aimed at eliminating poverty, protecting the planet, and ensuring peace and prosperity for all, both now and in the times ahead.
- The SDGs continue the initiatives **initiated by the MDGs.**
- They recognized that ending poverty and various forms of need should be combined with strategies that improve healthcare and education, diminish inequality, promote economic advancement, tackle climate change, and conserve our oceans and forests.
- **There are 17 SDGs which are as follows:**

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

Fig. 20.1: Sustainable Development Goals (SDGs)

- **India and SDGs**
  - The progress of the SDGs in India is being monitored by **NITI Aayog.**
  - In 2018, **Haryana** became the inaugural state to center its annual budget on achieving the SDGs.
  - India has committed **to reduce emission intensity by 45%** from the 2005 level by the year 2030.
  - Furthermore, India aims to achieve approximately 50% of its cumulative installed electric power capacity from non-fossil fuel energy sources by 2030.
  - India's updated NDC, with a long-term objective to achieve net-zero emissions by 2070, is notably commendable.

IGNITE YOUR MIND

Do you think the emphasis on economic growth within the concept of sustainable development is inherently contradictory to ecological sustainability?

The Nationally Determined Contribution (NDC):

At the core of the Paris Agreement and its overarching objectives lie the Nationally Determined Contributions (NDCs). NDCs embody individual country endeavors to curtail national emissions and address the challenges posed by climate change impacts. As stated in Article 4, paragraph 2 of the Paris Agreement, each Party is obliged to create, convey, and uphold consecutive NDCs they aim to fulfill. Parties are committed to implementing domestic measures to mitigate emissions, aligning with the objectives outlined in these contributions.

- **Green Climate Fund:**
  - It was established in 2010 under the financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC),
  - **Objective**: The Green Climate Fund serves as a channel for wealthier nations to provide funds to less affluent countries, aiding them in mitigating and adapting to climate change impacts.
  - Notably, the GCF stands as the pioneering climate finance mechanism that integrates gender perspectives across its decision-making processes right from its inception, guiding the allocation of its resources.
  - **Headquarters**: Incheon, South Korea
- **Global Environment Facility (GEF):**
  - It was founded on the eve of the 1992 Rio Earth Summit.
  - GEF is a family of funds which focuses on combating biodiversity loss, climate change, pollution, and pressures on land and ocean health.

- Utilizing grants, blended financing, and policy guidance, the GEF aids developing nations in tackling their significant environmental concerns and meeting international environmental agreements.
- Global Environment Facility (GEF) serves as a proactive force in environmental action and beyond. By strategically investing, the GEF collaborates with partners to address the most pressing global environmental challenges.
- The World Bank serves as the **GEF Trustee**, administering the GEF Trust Fund (contributions by donors).

❑ **Clean Development Mechanism (CDM):**
- It enables a nation with emission-reduction obligations under the Kyoto Protocol to execute emission-reduction initiatives in developing nations.
- These endeavors can generate tradable certified emission reduction (CER) credits, where each credit signifies one tonne of CO_2, contributing towards fulfilling Kyoto targets
- As the inaugural worldwide environmental investment and credit program, it offers a standardized emissions offset tool known as CERs.

❑ **Adaptation Fund:**
- Established in 2001, the Adaptation Fund was created to fund specific adaptation initiatives and programs in developing countries that are Parties to the Kyoto Protocol and especially susceptible to the detrimental impacts of climate change.

❑ **National Action Plan on Climate Change (NAPCC):**
- It delineates a domestic plan targeting the nation's ability to adjust to climate change and improve India's developmental trajectory's ecological sustainability.
- Emphasizing the importance of sustaining a robust growth rate, the strategy aims to elevate the living standards of India's populace while mitigating their susceptibility to climate change repercussions.
- Their focus lies in fostering comprehension of climate change, adaptation, and mitigation, as well as advocating for energy efficiency and the preservation of natural resources.

India and NDC

❑ As a participant in the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, India presented its initial Nationally Determined Contribution (NDC) in 2015, outlining two specific objectives:
- Decreasing the emissions intensity of its GDP by 33 to 35 percent by 2030 from the 2005 level.
- Attaining approximately 40 percent of cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.

❑ Both objectives have been surpassed ahead of schedule. By October 31, 2023, the cumulative electric power installed capacity from non-fossil fuel-based energy resources stands at 186.46 MW, constituting 43.81% of the total cumulative electric power installed capacity.

❑ According to India's third national communication submitted to the UNFCCC in December 2023, the country has achieved a 33 percent reduction in the emission intensity of its GDP between 2005 and 2019.

❑ In **August 2022, India revised its NDC**, increasing the goal of reducing emissions intensity of its GDP to 45 percent by 2030 from the 2005 level.

❑ Additionally, it raised the target for cumulative electric power installed capacity sourced from non-fossil fuel-based energy resources to 50% by 2030.

The UN Department of Economic and Social Affairs (UNDESA) operates within the United Nations Secretariat and holds the responsibility of advocating global sustainable development, fostering economic growth, and advancing social progress. Serving as a hub for the UN's approach to economic and social matters, it offers member states analysis, policy recommendations, and technical support.

SDG REPORT 2023

❑ The publication originates from the **United Nations Department of Economic and Social Affairs (UNDESA).**

❑ **Finland topped the** index ranking with a score of 86.76.

❑ In the SDG index 2023, India secured the 112th position among 162 countries, obtaining a score of 66 out of 100.

SDG India Index

❑ The SDG India Index monitors the advancement of all States and Union Territories based on crucial national indicators, evaluating their progress regarding the outcomes of interventions and programs implemented by the Government of India.

❑ The SDG India Index aims to offer a comprehensive perspective on the social, economic, and environmental conditions of the nation along with its Union Territories and States

❑ India stands as the pioneering nation in creating a government-led sub-national gauge of SDG progress.

❑ It was formulated in partnership with the **Ministry of Statistics and Programme Implementation (MoSPI), the United Nations in India, and the Global Green Growth Institute.**

- **Published by:** The publication of the SDG India Index is overseen by **NITI Aayog.**
- Through this Index, the government tracks the advancement of SDGs in India across states and Union Territories.

SDG India Index 2020-2021

- **The Performance of India in the SDG India Index 2020-2021 is as follows:**
- India's comprehensive SDG score rose by 6 points, advancing from 60 in 2019 to 66 in 2020-21,
- This was attributed to enhancements in delivering amenities such as clean water, sanitation, and accessible and sustainable energy, among other factors.
- **State wise performances were as follows:**
- **Kerala led the index,** securing a score of 75, **followed closely by Himachal Pradesh and Tamil Nadu,** both scoring 74.
- Conversely, Bihar, Jharkhand, and Assam **ranked lowest among the states** in the SDG India index.
- Among Union Territories, Chandigarh retained its top position with a score of 79, followed by Delhi at 68.
- In terms of progress, Mizoram, Haryana, and Uttarakhand emerged as the **leading gainers** in 2020-21, showcasing significant score improvements compared to 2019.

- **Government Schemes in the Direction of SDGs:** In alignment with these goals, various programmes are being executed, including:
  - National Health Mission for healthcare services, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PMJAY) for healthcare coverage.
  - Swachh Bharat Mission for household toilet access.
  - Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA) for employment.
  - Pradhan Mantri Awaas Yojana (PMAY) for rural and urban housing.
  - Pradhan Mantri Gram Sadak Yojana (PMGSY) for connecting unlinked settlements, Pradhan Mantri Jan Dhan Yojna (PMJDY) for financial services access.
  - National Social Assistance Programme (NSAP) offering social pensions to the elderly, widows, and people with disabilities.

India's Foreign Partnership for Global Good

India has played an active role in furthering global public goods by its initiatives, domestic policies, and engagements with nations on both bilateral and multilateral platforms.

- The establishment of **the International Solar Alliance (ISA), the Coalition for Disaster Resilient Infrastructure (CDRI), India's digital transformation using India Stacks, and the recent 'Lifestyle for the Environment (LiFE) Movement'** are instances that exemplify this contribution.
- These can be explained further as:
  - **Global Clean Energy**
    - Through the ISA's action plan known as **'One Sun One World One Grid' (OSOWOG),** the alliance aims to establish a unified solar grid on a global scale**.**
    - The most recent '**World Energy Investment 2023' report** from the International Energy Agency (IEA) underscores the recent surge in investments toward clean energy. This transition is primarily led by Electric Vehicles (EVs) and renewable energy sources. Highlighted in the report is India's significant efforts and commitment towards energy transition as part of its net-zero goals, positioning the country as a notable contributor in this direction.
    - The report also mentions India's sovereign green bonds as a landmark for the emerging sustainable finance ecosystem.
  - **Disaster Resilience**
    - Within the **India-led CDRI initiative,** the **Infrastructure for Resilient Island States (IRIS)** operates as a 'knowledge hub' where member nations exchange and adopt best practices for fortifying both existing and forthcoming infrastructure against disasters.
    - With a rising frequency of disasters, IRIS endeavors to fortify infrastructure in small island states, enhancing their resilience in the face of climate-related catastrophes. The CDRI has garnered extensive backing from both developing nations and the category comprising Least Developed Countries (LDCs) and Small Island Developing States (SIDS).
  - **One Earth One Health**
    - The global impact of the COVID-19 pandemic underscored the necessity for collaborative endeavors beyond national borders.
    - In this context, **Vaccine Maitri** embraced the principle of **One Earth One Health.**
    - By June 15, 2023, **Vaccine Maitri** facilitated the distribution of vaccine supplies, exceeding 301.24 million doses to over 100 countries. Additionally, telemedicine and digital health are reshaping the landscape of global healthcare.
  - **Sustainable Lifestyle Choices**
    - The Prime Minister introduced the **Lifestyle for Environment (LiFE)** mission at COP26, urging collective action for environmental preservation. The International Energy Agency (IEA) report indicates that LiFE's measures, like behavioral shifts and sustainable choices, could cut global CO_2 emissions by over 2 billion tonnes annually by 2030.

- Moreover, India's proposal designated 2023 as the **'Year of Millets'** by the UNGA, aiming to raise awareness about their nutritional value and resilience to climate change. This initiative aims to bolster food security, support farmers' livelihoods, and alleviate poverty in drought-prone regions.
- India's G20 Presidency fortified the LiFE initiative by integrating it into the G20's framework, with all G20 Ministers pledging to prioritize sustainable development in global cooperation.

- **Women-led Development**
  - India is transitioning from focusing solely on women's development to fostering women-led development by enhancing their access to education, skill training, and institutional credit.
  - This shift not only economically empowers women but also amplifies their potential contribution to the nation's GDP.
  - Estimates suggest that by ensuring equal opportunities for women, India could potentially increase its GDP by $770 billion by 2025.
  - India has allocated $50,000 to UN Women's core voluntary budget, bolstering support for the advancement of women's empowerment.
  - Government schemes in this regard are: Beti Bachao Beti Padhao, MUDRA scheme, Mission Poshan 2.0, Jan Dhan Yojana, and bridging the gender digital divide by providing technology in regional and Indian languages.

IGNITE YOUR MIND

Do you think India's recent initiatives, such as the LiFE Movement and its G20 leadership role in promoting sustainable development, are sufficient to accelerate progress towards the SDGs?

Climate Change Performance Index

- The Climate Change Performance Index (CCPI) is a rating mechanism developed by the German Watch, New Climate Institute and Climate Action Network International based in Germany.
- Since 2005, the Climate Change Performance Index (CCPI) has been published yearly as an independent monitoring instrument to assess the climate protection performance of 63 countries and the EU.
- Its **objective** is to increase transparency in global climate policies and facilitate the comparison of climate protection endeavors and advancements among individual nations.
- **The CCPI evaluates the performance of each country across four categories:**
  - Greenhouse Gas Emissions (40% of the total ranking).
  - Renewable Energy (20%).
  - Energy Consumption (20%).
  - Climate Policies (20%).
- It also addresses whether each country is undertaking suitable measures in Emissions, Renewable Energy, and Energy Consumption to meet the climate objectives outlined in Paris.

Climate Change Action Plan

- A climate action plan functions as a structured document aimed at measuring, monitoring, and decreasing greenhouse gas emissions while embracing strategies for climate adaptation.
- It serves as a guide for administrative entities to tackle the effects of climate change within their localities.
- The Climate Change Action Plan, a program falling under the central sector, was approved in 2014.
- **Objectives** of the climate change action plan are as follows:
  - The goal was to improve the nation's scientific and analytical capacities for assessing climate change.
  - Moreover, it sought to establish a framework and implement climate initiatives spanning a five-year duration.

There are Other Climate Change Action Plans Adopted Worldwide

- **Montreal Protocol:**
  - The Montreal Protocol governs the manufacturing, usage, and release of substances that deplete the ozone layer
  - Signed in 1987, it officially took effect in 1989.
  - It had the participation of 189 countries as signatories.
- **Kigali Amendment:**
  - An amendment to the Montreal Protocol was enacted and became effective in 2019.
  - This **legally binding agreement** commits to eliminating the use of hydrofluorocarbons (HFCs), with Libya becoming the 100th country to ratify it in 2020.
  - India has signed the Kigali Agreement.
  - India has successfully eliminated HFCs 141b, a substance with a potential for ozone depletion following CFCs, from its usage.

Hydrofluorocarbons (HFCs) are substances with the potential to deplete the ozone layer, serving as replacements for Hydrochlorofluorocarbons (HCFCs) and Chlorofluorocarbons.

IGNITE YOUR MIND

Assess the effectiveness of the National Water Mission's 'Jal Shakti Abhiyan: Catch the Rain' initiative in promoting rainwater harvesting and conservation. Evaluate the role of this initiative in addressing water scarcity issues, particularly in vulnerable regions, and analyze the allocation and utilization of funds for this nationwide campaign.

Concept of Inter-Generational and Intra-Generational Equity of Sustainable Development

- According to the Brundtland Commission on Sustainable Development, the current generation should fulfill its requirements while safeguarding the needs of future generations, ensuring a secure and healthy environment for their inheritance.
- The principle of **Intergenerational Equity in Sustainable Development** underscores the responsibility of today's generation to safeguard the environment and natural resources, ensuring they are passed onto future generations in their optimal state, allowing equal opportunities for all to relish a healthy environment.
  - The increasing disparity in resource distribution, ongoing environmental degradation, and resource depletion highlight the significance of Intergenerational equity.
  - This disparity is particularly stark between developed and developing nations, or between the Global North and South.
  - Additionally, developed nations currently show reluctance in aiding developing countries to address climate change, a consequence of prioritizing economic growth without considering environmental costs.
  - The notion of sustainable development emphasizes the responsible utilization of resources, ensuring their availability to meet future demands.
- Intra-Generational Equity within sustainable development pertains to fairness among individuals within the same generation, advocating for an equitable allocation of resources among them. This concept embodies the idea of inclusive development, promoting both social and environmental justice.
  - Intra-generational equity establishes the rights and responsibilities of each individual within a generation to utilize and conserve resources reasonably among its members.
  - Social justice is advocated to uphold intra-generational equity, often through government-led welfare initiatives like subsidies and reservations aimed at supporting vulnerable societal segments.
  - At times, measures undertaken in the name of social justice clash with the principles of a free market.
  - The free market ideology advocates minimizing state intervention, promoting the market as the ultimate solution to various issues.
  - Consequently, India implemented LPG reforms in 1991 following this approach. However, these pro-market changes failed to generate widespread positive impacts and instead led to jobless growth and escalating inequalities, as highlighted in the Oxfam Report.
  - Inclusive Growth seeks to provide fair opportunities for all economic participants during periods of economic expansion, ensuring that benefits extend across every segment of society.
- Inclusive growth and sustainable development stand as fundamental pillars within the global welfare narrative, achieved through the assurance of both intra-generational and intergenerational equity.
- In a developing nation such as India, prioritizing **intragenerational and intergenerational equity** gains greater significance as resources are vital for ensuring comprehensive development, including the needs of future generations, and distributing the benefits of rapid economic growth.

Green GDP: The Green Gross Domestic Product (Green GDP), an alternative to the regular GDP, reflects the environmental impact associated with a country's economic output. It factors in environmental considerations alongside the conventional GDP, measuring a nation's economic growth while accounting for aspects like biodiversity decline and expenses linked to climate change.

Green Tax: The Green Tax, alternatively termed Pollution Tax or Environmental Tax, is an excise duty imposed by the government on products that significantly contributes to pollution. Its intent is to dissuade the use of these goods, ultimately lowering pollution levels.

CONCLUSION

Confronting sustainable development and climate change is not about facing insurmountable hurdles, but seizing opportunities to innovate and collaborate for a fairer, more resilient future. Embracing sustainability, investing in clean tech, and global cooperation can curb climate change, fulfill the Sustainable Development Goals, and craft a prosperous world for the next generations.

₹549/-

PHYSICS WALLAH
PUBLICATION

PW APP

PW IAS WEB

www.pw.live
www.pwonlyias.com

Talk to our Counselor give a
Missed Call on: +91-9920613613

ISBN 978-93-6034-075-9